THE BOUNDARY BETWEEN HUMAN AND MACHINE IN SCIENCE FICTION

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Abstract

Robots, androids, sentient computers and other intelligent machines of science fiction are generally conceived as similar to human beings in some aspect, but lacking in another. These fictional figures constitute an artificial Other to human and provide basis for an inquiry on the old debate of what makes us human. This study focuses on the lack of the machine as it is presented in science fiction to trace the notion of being human through time and in cultural context.

Through an analysis of select science fiction texts referring to the main debates on the mind and body in philosophy, this work attempts to treat 'human' as a category, in relation to which it examines the 'machine.'

Özet

Robotlar, androidler, varlığının bilincinde bilgisayarlar ve bilim kurgunun diğer zeki makineleri genellikle insana bazı açılardan benzer, bazılarındaysa eksik olarak düşünülürler. Bu kurmaca figürler insana yapay bir Öteki oluşturur ve bizi insan yapanın ne olduğuna dair eski tartışmayı sorgulamak için zemin sağlar. Bu çalışma, zaman içinde ve kültürel bağlamı içerisinde 'insan' kavramının izini sürmek amacıyla makinenin bilim kurguda gösterildiği haliyle eksikliğine odaklanır.

Seçme bilim kurgu metinlerinin, zihin ve vücut üzerine felsefedeki temel tartışmalardan yararlanan bir analizi ile bu çalışma 'insan'a bir kategori olarak yaklaşır ve onunla bağıntılı olarak 'makine'yi inceler.

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1. Introduction

human being, n. a man, woman or child of the species *Homo sapiens,* distinguished from other animals by superior mental development, power of articulate speech, and upright stance. [1]

Throughout the history, the human artifice has dwelled in mythical, theoretical, fictional and empirical domains; gaining a different bearing in each. It comes in different forms and with various attributions in these domains varying from primitive automata to organic androids; yet it is usually something to be feared of, and almost exclusively something subhuman. The human artifice, which is basically an object with humanlike features, offers a mirror to us human beings on the perennial question of what we are; still, what is seen in the mirror depends on the eye of the beholder.

In science fiction [SF], a relatively young literary genre, the human artifice comes up too often; so that some concepts and terms conceived by the authors permeate to the real world. Robots, androids and sentient computers[2] -in their fictional sense- are common figures in popular culture

[1] *Oxford Dictionary of English for Kindle.*
[2] For explanations of these concepts in the context of this study, see Glossary of Terms.

due to the accumulation of related SF. Furthermore, the mutual inspirational and critical liaison between SF, science and philosophy has both led to an exhaustive debate on whether a human could be built artificially, and to the concrete efforts paving the way to build one. In this interactivity, SF holds a special position since as Joanna Russ formulates, SF is more concerned with "what if" than "how":

> Science Fiction is *What If literature*. All sorts of definitions have been proposed by people in the field, but they all contain both The What If and The Serious Explanation; that is, science fiction shows things not as they characteristically or habitually are but as they might be, and for this 'might be' the author must offer a rational, serious, consistent explanation, one that does not (in Samuel Delany's phrase) offend against what is known to be known. … If the author offers marvels and does not explain them, or if he explains them playfully and not seriously, or if the explanation offends against what the author knows to be true, you are dealing with fantasy and not science fiction.[3]

The main theme of this dissertation is the boundary between human and machine in SF. The vast majority of SF on the human artifice presents it as something which closely resembles a human being, but is lacking in some aspect. Furthermore, most of the fictional characters of artificial nature aspire to become human. In this context, is there an essence to being human, if so, what is it? Can a thinking machine "be" human or does the term solely correspond to the members of a species? My hypothesis is that "human" is a social construct which is subject to change in regard to the cultural context and through time.

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[3] Quoted in Jeanne Cortiel, *Demand My Writing:Joanna Russ/Feminism/Science Fiction* (Liverpool: Liverpool University Press, 1999), pp.3-4. Originally from Joanna Russ, *The Image of Women in Science Fiction* (The Red Clay Reader: N.p., 1971), p. 79. Italics in original.

From clunky robots to hardly distinguishable androids, the human artifice has many faces in SF. Furthermore, relatively recent representations of computers and digitally virtual beings in SF are imagined to possess some human capacities such as thought or curiosity. Still, not all the characters with a touch of artificiality could be considered as human artifice. Ontologically, it would be far fetched to include for instance clones or lab-grown embryos into this category; since they would be human albeit the abnormality of their nature. On the other hand, fully organic androids might be considered as artifice, if they are lab-grown into adult bodies and/or are programmed into what human beings normally learn. Cyborgs, which basically are technologically altered human beings, are indeed borderline beings in the man-machine dichotomy; yet the fact that they are originally human beings makes their case the topic of another debate.

Methodologically, the extent of SF as a genre poses an issue. Initially, the theoretical frame of the genre has been constructed by editors, authors and critiques which were also part of what was being published; still there has been no real canon to what SF is. Most of the definitions that emerged since Pulp Era leave some works of fiction which were intended to be SF outside the genre. Hugo Gernsback, the editor who coined the term 'science fiction' in 1929, believed that SF should be based on existing scientific laws or the deduction made thereof[4]. Arthur Koestler, on the other hand, argued that *Nineteen Eighty-Four* and *Brave New World* are not SF because "in them the oddities of alien worlds serve merely as a background

[4] Adam Roberts, *Science Fiction* (London and New York: Routledge, 2000), pp. 31-32.

or pretext for a social message."[5] Thence Damon Knight claimed that SF "means what we point when we say it" by reasoning that "trying to get two enthusiasts to agree on a definition of it leads only to bloody knuckles." [6]

One of the most referred definitions is that of Darko Suvin, who formulated the concept of *cognitive estrangement* with the influence of Russian Formalists' *ostranenie* [defamiliarization], Brechtian *Verfremdung* and Ernst Bloch's approach thenceforth.[7] Bloch predicates that the *Verfremdungseffekt* is the effect of creating distance, which "occurs as the displacement or removal of a character or action out of its usual context, so that the character or action can no longer be perceived as wholly self-evident"[8] Estrangement [Verfremdung] is a technique of detachment that is used by myth, fantasy or other genres which drift away from mimetic fiction; thus it is the cognitive quality which constitutes the second sine qua non element of SF. Basically, the estrangement should be validated by a scientific explanation which need not be based strictly on existing scientific facts as Gernsback had proclaimed; but may be "methodically developed against the background of already existing cognitions, or at the very least as a 'mental experiment' following accepted scientific, that is, cognitive, logic"[9] Therefore Darko Suvin defines SF as:

> […] a literary genre whose necessary and sufficient conditions are the presence and interaction of estrangement and cognition,

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[5] Damon Knight, *In Search Of Wonder: Essays on Modern Science Fiction* (Chicago: Advent Publishers, 1967), p.ii.
[6] Knight, *In Search Of Wonder*, p. 2.
[7] Darko Suvin, "On the Poetics of the Science Fiction Genre", *College English,* 34:3 (Dec., 1972): p. 374.
[8] Ernst Bloch, Anne Halley, Darko Suvin, "Entfremdung, Verfremdung", *The Drama Review: TDR ,* 15:1 (Autumn 1970): 121.
[9] Darko Suvin, *Metamorphoses of Science Fiction: on the Poetics and History of a Literary Genre,* (New Haven and London; Yale University Pres:1979), p. 66.

> and whose main formal device is an imaginative framework alternative to the author's empirical environment.[10]

Suvin's approach is comprehensive, albeit slightly constrictive for the topic of this dissertation. Suvin asserts that it is impossible for SF to acknowledge any metaphysical agency[11] while the works of fiction that deal with the notion of 'being human' cannot always be disaffiliated with the dualist approach to the philosophy of mind or relevant mysticism. Since the theme itself requires the discussion of metaphysics, the selection of SF texts is somewhat more extensive than what Suvin dictates. Nonetheless, this dissertation adopts the Suvinian approach to SF overall.

Another methodological issue that this study poses is on the selection of primary sources. On the one hand, the amount of SF which somehow deals with forms of thinking machines is massive, so that it would be practically impossible to feature all. On the other hand, a substantial part of such SF does not inquire into the existential issues of the thinking machine. Basically, the selected SF featured in this study has characters of artificial nature that are capable of using the pronoun "I", or in other words, who question their own existence in comparison with their human counterparts. Another inevitable limitation for the selection of texts stems from the availability of related titles in print or online. Moreover, the study mainly focuses on Western SF since translations of Eastern titles are not always available and the philosophical context introduced in upcoming chapters is mostly of Western disputes. Within this frame, only the most significant opuses are examined in depth in relation to our main question;

[10] Suvin, *Metamorphoses*, pp. 7-8.
[11] Suvin, *Metamorphoses*, p. 66.

albeit for the precursors of the genre, the selection of texts is made relatively more liberally to draw the outlines of the issue from a broader perspective.

In the following chapters, I shall respectively discuss the human artifice in its historicity and the possibility and implications of an artificial Other.

2. A Brief History of the Human Artifice in Science Fiction

> Because we do not understand the brain very well we are constantly tempted to use the latest technology as a model for trying to understand it. In my childhood we were always assured that the brain was a telephone switch-board. ('What else could it be?') I was amused to see that Sherrington, the great British neuroscientist, thought that the brain worked like a telegraph system. Freud often compared the brain to hydraulic and electro-magnetic systems. Leibniz compared it to a mill, and I am told that some of the ancient Greeks thought the brain functions like a catapult. At present, obviously, the metaphor is the digital computer.[12]

SF, as a genre, is inherently resistant to strict definitions or insurmountable borders with other genres; still it is hardly difficult to determine whether a work of fiction is SF or not, even for the less sophisticated reader or audience. Meditating on speculative fiction, Samuel R. Delany remarks that a sole sentence such as "The red sun is high, the blue is low." sufficiently and instantly makes the reader realize that they are

[12] John Searle, *Minds, Brains and Science: 1984 Reith Lectures* (Cambridge, Mass: Harvard University Press, 1984), p. 42.

now reading of a strange land.[13] However, not everything that might estrange the reader from their own reality makes a novel or a film SF. Vampires, magic or evil gods dwelling in dark lands are as unfamiliar to us as laser guns, exoplanet colonies, teleportation devices or aliens are; although it's rather obvious that the latter group is relevant to SF. It is the 'science' part of SF which makes the genre distinctive. Darko Suvin explains this *sine qua non* element of SF with his term *novum,* which is the Latin for 'new'. *Novum* refers to 'a strange novelty'[14] integral to the plot, which might be a fictional technological device, a scientific breakthrough, even a setting or a character.

> Clearly the novum is a mediating category whose explicative potency springs from its rare bridging of literary and extraliterary, fictional and empirical, formal and ideological domains, in brief from unalienable historicity. [15]

The main characteristic of the *novum* is the scientific explanation, which need not mean that it should be scientifically feasible at the time it was thought of; but it must be "postulated on and validated by the post-Cartesian and post-Baconian scientific method." [16] For instance, in the case that an SF novel has 'mind-reading' as its *novum*, the phenomenon might be reasoned by the usage of an instrument that works on brain waves, or a newly developed human ability as part of evolutionary progress, instead of occult or black magic. Adam Roberts explains that the "*nova* are grounded in a discourse of possibility, which is usually science or technology, and

[13] Samuel R. Delany*,* "About Five Thousand One Hundred and Seventy Five Words", *SF: The Other Side of Realism,* ed. Thomas D. Clareson (Bowling Green, OH: Bowling Green University Popular Press, 1971), p.137.
[14] Suvin, "On the Poetics", p. 381.
[15] Suvin, *Metamorphoses,* p. 64.
[16] Suvin, *Metamorphoses* pp. 64–65.

which renders the difference a *material* rather than just a conceptual or imaginative one. The emphasis is on difference, and the systematic working out of the consequences of a difference or differences, of a *novum* or *nova*, becomes the strength of the mode."[17]

In this chapter, we are going to overview notable manifestations of the human artifice as *novum* in SF; from the primitive, patched-up human artifice to fully digital minds. In order not to disjoin these texts from their historicity, we will follow a mostly chronological method, by starting with the roots of the artificial human in myth and briefly heeding technological context when necessary.

2.1. Myth, Craftsmanship, and Pre-SF Literature

Judeo-Christian tradition, which is the most binding influence on western SF, is itself fed from the Mediterranean civilizations that produced manifold myths about man playing the creator. It is possible to trace the human artifice back to the ancient times, where in most cultures inanimate objects were worshipped in relation to idolatry. *Ushabti,* little figures made of wax or clay, were part of burial traditions in ancient Egypt. They were believed to perform little chores for the dead, including 'answering' in their place.[18] In Greek mythology, the talented craftsman Daedalus is believed to have fashioned similar statues. In Plato's *Meno*, Socrates describes the

[17] Roberts, *Science Fiction,* p.7.
[18] Moshe Idel, *Golem : Jewish Magical and Mystical Traditions On the Artificial Anthropoid* (SUNY Press: Albany, 1990), p. 3.

statues so lifelike "that if they are not fastened up they play truant and run away; but, if fastened, they stay where they are."[19] Myths of talking statues evolved into simulacra and automata; especially by the development of clockwork, the simulated and the automated has moved past myth and became reality.

> The designs of the simulacra were derived from two sources in the nature, celestial bodies and biological forms. Man created pictorial representations of the starry firmament and of biological forms such as birds, animals and man himself. Then he built models, and the models were automated.[20]

Some of the most fabled automaton makers originated from Islamic civilization. Ismail ibn al-Razzaz al-Jazari left behind his *Book of Ingenious Devices* (1207) which covers his designs for many automated devices, including a clock in the shape of an Indian elephant that worked on water.[21] Still, mechanically engineered artifice is not the sole origin of 'mechanical' Other in SF; the taboo of 'man playing God' derived from another string of myth and legend.

> The concept of an artificially created man is blasphemy in our cultural sphere. Such a creation must be performed by man and is therefore a caricature, an attempt by humans to become equal to God. According to Christian dogma, such audacity cannot succeed; should it happen, it necessarily means that satanic forces were engaged in the work, that hell has helped the creator of the homunculus. But there exist myths from pre-Christian times which talk about homunculi and do not consider them the result of cooperation between humans and the devil. Those myths arose in pre-Christian times, far from Judaism. A religion can be quite neutral toward the "artificial production of human beings"; only the Mediterranean culture, modified by Christianity, considers the homunculus to be the result of blasphemy. It is for this reason that those "archetypal robots," those literary

[19] Plato, *Meno*, Trans. Benjamin Jowett , http://classics.mit.edu/Plato/meno.html, 97d.
[20] Patricia S. Warrick, *The Cybernetic Imagination in Science Fiction* (Cambridge, Massachusetts and London: MIT Press, 1980), p. 30.
[21] Ehsan Masood, *Science and Islam: A History* (London: Icon Books, 2009), pp.163-164.

> prototypes from earlier centuries such as the golem, are as a rule evil or at least sinister.[22]

Prometheus is mainly known as the figure that stole fire, the 'means of life' from Zeus and gave it on people in Greek mythology.[23] But in some later versions of the tale, Zeus leaves him the task to create men and women. For instance, in Ovid's *Metamorphoses,* Prometheus' son Deukalion professes that his father has the ability to mould men and women from clay and breathe life into them.[24] Prometheus' ability to create life is rather a rare gift from the gods than something achievable through one's own means. Contrarily, the legends about the Golem and the Homunculus are always accompanied with notions of hard work, devotion and imperfection.

Golem, the artificial man of Jewish Mythology appears in several texts, as parts of different legends. According to one of the prior mentions of the Golem, Amora Rava of Babylonia creates a man who could not speak. Thence labeled as the creation of magic, it is returned to dust by another Rabbi. [25] The texts about latter attempts to create a Golem emphasize the study of *Sefer Yetzirah* (The Book of Creation) and the use of Holy Words.[26] In many versions of the story, the creature comes to life after the word "*emet"*, truth, is written on its forehead, and similarly is destroyed when the *aleph* is erased from its forehead, leaving "*met",* which

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[22]Stanisław Lem, "Robots in Science Fiction", *SF: The Other Side of Realism,* p. 309.
[23] Hesiod, *Works and Days*. http://omacl.org/Hesiod/works.html, lines 42-53.
[24] Ovid, *Metamorphoses,* trans. Horace Gregory (Canada: Macmillan Company of Canada Ltd, 1958), p. 14.
[25] *Babylonian Talmud* http://www.come-and-hear.com/sanhedrin/sanhedrin_65.html, Tract Sanhedrin 65b.
[26] Howard Schwartz, *Tree of Souls:The Mythology of Judaism* (Oxford and New York: Oxford University Press, 2004), pp. 279-284.

means 'dead'.[27] It is not a surprise that Golem, which is created by the power of words, lacks the ability to speak, since the Golem is categorically inferior to the man.

In late 16th century, Rabbi Judah Loew, also known as the Maharal, is told to have created a Golem to protect the Jewish community of Prague from recurring pogroms. According to this relatively detailed legend, the Golem of Prague not only protects the community, but also solves the mystery proving the Jewish people innocent, hence putting an end to the pogroms. [28] Almost all versions of the Golem legends end with the disposal of the Golem after it serves its purpose. The Golem might be considered as an incomplete attempt to create a human; in the Babylonian Talmud it is implied that Adam was created in a similar manner.[29] Still, because the Golem is the creation of the Man and not that of the God, it is imperfect and subhuman.

Similarly, the *homunculi,* artificially created human bodies, kept medieval alchemists occupied as well, both in Europe and the Middle East. There is a variety of methods in creating *homunculi* in different texts, but the end result usually is imperfect – like the Golem. In contrast, the Far East does not quite have the sin factor when it comes to the artificial human. Legends about automata date back to Ancient China; however the most

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[27] Idel, *Golem* , p.3.
[28] Schwartz, *Tree of Souls*, pp.282-283.
[29] "In the first hour, his [Adam's] dust was gathered; in the second, it was kneaded into a shapeless mass. In the third, his limbs were shaped; in the fourth, a soul was infused into him; in the fifth, he arose and stood on his feet; in the sixth, he gave [the animals] their names; in the seventh, Eve became his mate; in the eighth, they ascended to bed as two and descended as four; in the ninth, he was commanded not to eat of the tree, in the tenth, he sinned; in the eleventh, he was tried, and in the twelfth he was expelled [from Eden] and departed, for it is written, Man abideth not in honour." *Babylonian Talmud,* http://www.come-and-hear.com/sanhedrin/sanhedrin_38.html , Tract Sanhedrin 38b.

influential phenomenon on the perception of robot in Eastern SF probably is the Japanese puppetry tradition. In Japanese culture, puppetry is mostly used as a narrative form, both in theaters [*bunraku*] and festivals. Introduced in Osaka in the 17th century, *karakuri ningyô* were automata which were mostly built for the puppet theaters but in time adjusted to domestic use as well.[30]

The interest of al-Jazari's European counterparts in automata developed mainly after the Renaissance, and flourished even later, in 18th century. From a wider perspective, the automaton was not only a toy for the rich adults, nor was it solely an important step in technology that would result in contemporary robotics. The automaton has constituted an object to muse about; both for writers, artists, scientists and philosophers alike, such as Descartes.

Perhaps it was Mary Wollstonecraft Godwin Shelley, who was the first one to truly try the boundaries of human, with her debut novel *Frankenstein: The Modern Prometheus* (1818). In the summer of 1816, at a villa near Lake Geneva, she set off to write a horror story; what she wrote in the following two years has become an important precursor of SF. Victor Frankenstein, a science and alchemy enthusiast, is obsessed with the mysteries of life and death. Unlike Prometheus who was bestowed with "the gift to breathe life into lifeless earth"[31], Frankenstein works his own way to find the means to infuse life to the once dead organism. The Being

[30] Barbara E. Thornbury, "Puppets on Strings and Actors on Floats: Japan's Traditional Performing Arts in a Festival Setting", *The Journal of the Association of Teachers of Japanese,* 26:2 (Nov., 1992): p. 184.
[31] Ovid, *Metamorphoses* p.14.

created by Victor Frankenstein is made entirely by human parts collected from churchyards, of which he had been selective as to make his creation perfectly beautiful[32]; but when the Being is animated, it turns out to be a monster.

> Oh! No mortal could support the horror of that countenance. A mummy again endued with animation could not be so hideous as that wretch. I had gazed on him while unfinished; he was ugly then, but when those muscles and joints were rendered capable of motion, it became a thing such as even Dante could not have conceived.[33]

At first, the monstrosity of the Being stems from the abnormality of how it looks; which makes Frankenstein to abandon it right after its 'birth'. The Being, which we learn later that was not inherently evil, becomes the monster he was believed to be in the search for his creator's, his father's, attention. Frankenstein: The Modern Prometheus might be read as an allegory of a child depraved of a childhood; or rather as a projection of Shelley's own misfortune regarding childbirth. For SF, albeit not explicitly drawn as so in the novel itself, the Being is the creation of science since Mary Shelley acknowledges that she was influenced by the work of Erasmus Darwin on galvanism[34]. Both in terms of SF and science itself, Frankenstein's ethical impact is far from negligible, since the Frankenstein Complex, which basically is the human fear of robots[35], haunts fictional and

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[32] Mary Shelley, "Frankenstein**"**, *Frankenstein : the 1818 text contexts nineteenth-century responses modern criticism*, ed. J. Paul Hunder (New York and London: Norton, 1996), p. 34.
[33] Mary Shelley, *Frankenstein,* p.35.
[34] Paul K. Alkon, *Science Fiction before 1900: Imagination Discovers Technology* (New York and London: Routledge, 2002), p. 4.
[35] The term is coined by Isaac Asimov and is referred in several texts, most notably in: Isaac Asimov, "The Machine and the Robot", in *Science Fiction: Contemporary Mythology: the SFWA –SRFA Anthology*, ed. P. S. Warrick, M. H. Greenberg & J. D. Olander (New York: Harper and Row, 1978), p.252.

real scientists. The Being can be considered as the prototype of many to come: monsters created by the scientist who crosses the line while playing the God.

With Industrial Revolution underway and Charles Darwin's *On the Origin of Species by means of Natural Selection* (1859) published; literature has started colliding paths with science; initially with Jules Verne in France. Meanwhile, another antecedent of our theme; *Huge Hunter or the Steam Man of the Prairies* (1868) of Edward S. Ellis was published in the USA. *The Huge Hunter* is basically a western with a touch of scientific imagination. Ellis recounts the story of an ingenious invention; a mechanical man powered by steam which was mainly used to scare and ward off the Indians. The steam man had an impressively frightful appearance, but it was not automated –it needed a rider to operate– hence it was nothing more than a device, an elaborate replacement for a horse:

> Johnny therefore made it of gigantic size, the body and limbs being no more than 'Shells,' used as a sort of screen to conceal the working of the engine. This was carefully painted in the manner mentioned in another place, and the machinery was made as strong and durable as it was possible for it to be. It was so constructed as to withstand the severe jolting to which it necessarily would be subjected, and finally was brought as nearly perfect as it was possible to bring a thing not possessing human intelligence.[36]

The advance of technology brought in by the Industrial Revolution was not welcome everywhere. The *modus vivendi* of the ordinary person was changing considerably fast and drastically with the steam power, factories, trains or the telegraph; and the fear of that current of change

[36] Edward Sylvester Ellis, *The Huge Hunter*, http://www.gutenberg.org/ebooks/7506.

developed into technophobia. Like any other common sentiment, technophobia too found its way to literature; still in the form of SF.

Samuel Butler's *Erewhon or Over the Range* (1872) is a satire, mostly describing Erewhon[37], a country cut off from the rest of the world. Amongst many peculiarities of Erewhonian society, their technophobia is distinctively important for us; because Butler explains this by applying Darwinism to machines. This attempt has sometimes been considered as a satire of Darwinism, although Butler himself rejects those claims in the preface to the second edition by stating that "Nothing could be further from my intention."[38]

The Book of Machines, a certain part of *Erewhon* (Chapters 23-25), actually confers of a book of the same title, written by an acclaimed Erewhonian professor, which caused the ban of machinery in all Erewhon after its wide acknowledgment. The book asserts that machines will eventually develop consciousness and "supplant the race of man, and [to] become instinct with a vitality as different from, and superior to, that of animals, as animal to vegetable life."[39] *The Book of Machines* also suggests the systematical usage of machinery in the production of machines is a form of reproductive system; and the need of humans in that process is not much different from plants necessitating insects for fertilization.[40]

> 'There is no security'—to quote his own words— 'against the ultimate development of mechanical consciousness, in the fact of machines possessing little consciousness now. A mollusc has not much consciousness. Reflect upon the extraordinary advance

[37] Note that Erewhon is the anagram of nowhere.
[38] Samuel Butler, *Erewhon*, http://www.gutenberg.org/ebooks/1906
[39] Butler, *Erewhon*.
[40] Butler, *Erewhon*

> which machines have made during the last few hundred years, and note how slowly the animal and vegetable kingdoms are advancing. The more highly organised machines are creatures not so much of yesterday, as of the last five minutes, so to speak, in comparison with pastime. Assume for the sake of argument that conscious beings have existed for some twenty million years: see what strides machines have made in the last thousand! May not the world last twenty million years longer? If so, what will they not in the end become? Is it not safer to nip the mischief in the bud and to forbid them further progress?'

The idea of machine evolution has become overbearingly popular in 20th century; in contrast, the few 19th century precursors mostly followed Mary Shelley's path of dealing with unique creations and isolated phenomena of obtained sentiency. For instance, French writer Auguste Villiers de L'Isle Adam took the automaton one step further when he created the female android, *l'andréïde* to be more precise, in his *L'Ève Future* (Tomorrow's Eve - 1886). Technophilia in its prime, *Tomorrow's Eve* has Thomas Alva Edison, the most prominent inventor of 19th century as its protagonist. Villiers explains that his hero was not exactly the Thomas Edison who was alive when the book was published, but rather a fictional character inspired by the legends around Thomas Edison, the *Sorcerer of Menlo Park.* [41] The android Hadaly, created by this fictional Thomas Edison consisted of four parts:

> 1. The live, internal System, which includes Balance, Locomotion, Voice, Gesture, the Senses, possible facial Expressions, the inner action regulator, or if you prefer, "the Soul";
> 2. The plastic Mediator, which includes the metallic envelope insulated from the epidermis and the flesh tint, a sort of armor with flexible articulations to which the internal System is firmly attached;

[41] Comte de Auguste Villiers de L'Isle Adam, *L'Ève Future,* http://www.gutenberg.org/ebooks/26681, Avis au Lecteur.

> 3. The Carnation (or properly speaking, imitation flesh), superimposed upon and adhering to, and penetrated by the Mediator, the animating fluid) –which (penetrating includes the traits and lines of the imitated body, with that body's particular personal emanation reproduced, the responses of the skeleton, the modelling of veins, musculature, the model's Sexuality, all bodily proportions, etc.;
> 4. The Epidermis or human skin, which includes and controls the Complexion, Porosity, Features, the sparkle of the smile, the imperceptible creases of Expression, the precise labial movements of speech, the hair and the entire pilose system, the ocular set, together with the individuality of the Glance, the Dental and Ungular systems.[42]

A fairly intricate mechanism for its time, Hadaly is later fashioned to duplicate a certain woman, the beautiful but stupid Alicia Cleary, whom Edison's old friend, Lord Ewald claimed to love to the verge of suicide. Hadaly is presented – in a blatantly misogynistic manner– as superior to any woman; it doesn't even have reproductive organs which Edison thought would taint the perfect woman. However, what completes Hadaly is not something anticipated by Edison. Sowana, a mysterious spirit which is somehow related to a cataleptic woman who is part of Edison's studies on mind, gradually takes control of the android and becomes her, leaving the woman dead. Sowana's nature is not revealed in the novel but it clearly is of external origin to the android.[43] In that sense the ambiguity reflects "Edison's (and Villiers') primary concern in the novel: the retention, recording, and reproduction of a 'reality' that will always remain uncertain and problematic."[44]

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[42] Comte de Auguste Villiers de L'Isle Adam, *L'Ève Future,* quoted in English in Annette Michelson, "On the Eve of the Future: The Reasonable Facsimile and the Philosophical Toy" *October,* 29 (Summer 1984): p. 11.
[43] Alkon, *Science Fiction before 1900,* pp.87-88.
[44] Daniel Gerould, "Villiers de l'Isle-Adam and Science Fiction", *Science Fiction Studies,* 11 :3 (Nov., 1984): 321.

Another automaton-gone-awry story, Moxon's Master (1893), focuses on the notion of life. Moxon, who believes that all matter holds consciousness, creates a chess-playing automaton.[45] By attributing consciousness to all matter –which is a rare tendency in any sort of philosophy or fiction–, Ambrose Bierce introduces an unorthodox and broad understanding of life which extends to the automaton. The nameless narrator of the story thinks the automaton is a human at first sight, with something unearthly in its movements[46]. By contrast, the automaton's movements become entirely humanly when it rages over the loss of the chess game and murders its master; though its face remains calm and deep in thought as if it was still playing the game.[47]

In late 19th and early 20th century, extraordinary machinery became more and more common in fiction, mostly due to the popularity of the two fathers of SF –Jules Verne and H.G. Wells. These machines, such as the time machine of Wells or Nautilus of Verne, were undeniably phenomenal, yet they were still 'mere machines'. Furthermore, utopian fiction took an interest in machines as well, usually in the form of *mechanized societies*. *Looking Backwards* (1888) of Edward Bellamy is the story of Julian West, who sleeps till the year of 2000 by an accident of a sleeping device. He finds himself in a strange future, where the prosperous society is much automated with the help of technology. However, E. M. Forster takes his similar extrapolation to the opposite direction with "The Machine Stops"

[45] Inspired by the Turk, the 18th century chess-playing machine of Wolfgang von Kempelen which was later revealed to be a hoax.
[46] Ambrose Bierce, *Moxon's Master,* http://www.upword.com/bierce/moxon.html
[47] Bierce, *Moxon's Master.*

(1909). The people of Forster's imagined future depend absolutely on *the Machine,* which is revealed to be failing irreparably, to the extent that all aspects of their lives are regulated by it.

> "Cannot you see, cannot all you lecturers see, that it is we that are dying, and that down here the only thing that really lives in the Machine? We created the Machine, to do our will, but we cannot make it do our will now. It was robbed us of the sense of space and of the sense of touch, it has blurred every human relation and narrowed down love to a carnal act, it has paralysed our bodies and our wills, and now it compels us to worship it. The Machine develops - but not on our lies. The Machine proceeds - but not to our goal. We only exist as the blood corpuscles that course through its arteries, and if it could work without us, it would let us die."[48]

Forster's train of thought, which renders man a machine part, is used by many authors and film directors further in the 20th century. With the development of technology, the human-machine interaction in fiction started to manifest as actual linkage; as a form of *cyborgization.*

The last opus to be treated in this subchapter is the play *R.U.R* or *Rossum's Universal Robots*, written by the Czech author Karel Čapek. Premiered in 1921, *R.U.R.* is specifically important for us since it was Čapek who coined the term *'robot',* which derived from the Czech noun *'robota',* meaning 'labor'. [49] Much like its contemporaries, *R.U.R.* is a critique of the system; Čapek uses artificial humans as a metaphor for the proletariat. Rossum's Universal Robots is a factory producing artificial humans, made of 'living matter' which is organized in a different, simpler and quicker way than that of the Nature.[50] In most of the robot fiction where

[48] E. M. Forster, *The Machine Stops*, http://archive.ncsa.illinois.edu/prajlich/forster.html
[49] It was actually Joseph Čapek, Karel Čapek's brother who suggested using the word '*robota'* for the artificial workers in R.U.R. http://capek.misto.cz/english/robot.html
[50] Karel Čapek, *R.U.R*. http://ebooks.adelaide.edu.au/c/capek/karel/rur/ Introductory Scene.

the master-servant relation is accentuated, the robot's servant features are provided by its production process; things that would make it dangerously close to human are left out deliberately by the creator.

> He threw out everything that wasn't of direct use in his work, that's to say, he threw out the man and put in the robot. Miss Glory, robots are not people. They are mechanically much better than we are, they have an amazing ability to understand things, but they don't have a soul. Young Rossum created something much more sophisticated than Nature ever did - technically at least![51]

The organic robots of Čapek evolve as the machines of Butler do. The plot pattern of evolution and rebellion are almost always used together in SF; since there is the ever lingering power relationship between the Man and the Machine in SF and the machine evolution breaks it for better or worse.

2.2. From Pulp to Cyberpunk

The pulp magazines of early 20th century have been publishing stories which would be called SF afterwards; but the first pulp to publish SF exclusively was the *Thrill Book* in 1919.[52] Although a significant part of the stories published in this sort of magazines were branded as "kinetic, fast-paced and exciting tales that are also clumsily written, hurried in conception, and morally crude,"[53] pulp magazines contributed crucially to the genre not only in terms of accumulation of fiction, but also as a channel

[51] Čapek, *R.U.R.* Introductory Scene.
[52] Roberts, *Science Fiction,* p. 67.
[53] Roberts, *Science Fiction,* p. 68.

of theoretical debate –since initially, the genre itself was formed around these magazines.

Lester del Rey's female robot story "Helen O'Loy" was first published in *Astounding Science Fiction* in 1938. Del Rey's protagonists create the perfect woman of male chauvinism from plastic and metal.

> "Helen O'Loy she is, Phil." And that's how it began—one part beauty, one part dream, one part science; add a stereo broadcast, stir mechanically, and the result is chaos.[54]

Helen O'Loy[55] is a robot with tear glands and taste buds; she is also equipped with emotions, consciousness and an unconditional, passionate *love* towards her creator. Her most evident lack is the capacity to bear children; still she makes the perfect wife, never losing her flare for cooking and making a home. [56] Moreover, she kills herself when her husband, who was also her creator, dies of old age. "Helen O'Loy" is an unusual early sample of robot fiction where the robot proves its humanity according to gender roles. Most of the robots in fiction are gendered if they look dangerously like humans, but it is not quite common to prove humanity through being a good wife or husband.

"Helen O'Loy", and Eando Binder's "I, Robot" (1939) were the two stories that had influenced Isaac Asimov into writing *robot-as-pathos* stories in his own terminology; stories in which "the robots were loveable and usually put on by cruel human beings."[57] Subsequently, Isaac Asimov's first robot story "Robbie" was published by *Super Science Stories* in

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[54] Lester Del Rey, "Helen O'Loy", *Science Fiction Hall of Fame Volume One: 1929-1964,* ed. Robert Silverberg, (New York: Tor, 2003) p.22.
[55] Her name derived from Helen of Alloy, a pun on Helen of Troy.
[56] Del Rey, "Helen O'Loy", p.26.
[57] Isaac Asimov, *The Complete Robot,* (London; Voyager, 1995), p.9

September 1940 under the title of "Strange Playfellow". Robbie is a selfless, obedient, metallic robot with an implied caring aspect and it is practically the model for most of the friendly robot characters in SF since.

Asimov wrote significant amount robot fiction in a span of half a century and he is undeniably one of the most influential writers in this area of SF. The term he brought up for the science of robot research, *robotics,* has been adopted by scientists.[58] In "Runaround" (1942), Asimov also introduced his *Three Laws of Robotics,* which have had a colossal effect in SF and intriguingly in science. The Laws are used by other authors and screenwriters, and have been debated by cyberneticists.

> Powell's radio voice was tense in Donovan's ear: "Now, look, let's start with the three fundamental Rules of Robotics-the three rules that are built most deeply into a robot's positronic brain."
> In the darkness, his gloved fingers ticked off each point.
> "We have: One, a robot may not injure a human being, or, through inaction, allow a human being to come to harm."
> "Right!"
> "Two," continued Powell, "a robot must obey the orders given it by human beings except where such orders would conflict with the First Law."
> "Right."
> "And three, a robot must protect its own existence as long as such protection does not conflict with the First or Second Laws."
> "Right! Now where are we?"
> "Exactly at the explanation. The conflict between the various rules is ironed out by the different positronic potentials in the brain. We'll say that a robot is walking into danger and knows it. The automatic potential that Rule 3 sets up turns him back. But suppose you order him to walk into that danger. In that case, Rule 2 sets up a counterpotential higher than the previous one and the robot follows orders at the risk of existence."[59]

[58] 'Robotics' first appears in *Liar!* (published in May 1941), but in his introduction to the Complete Robot, Asimov claims that he coined the term in *Runaround,* which was written in October 1941 and published in 1942 probably because he elaborates the term in the latter.
[59] Isaac Asimov, "Runaround", *The Complete Robot*, pp. 269 – 270.

Asimov has played with the laws and their implications in most of his robot stories. In *Robots and Empire* (1985) he introduced a *Zeroth Law* preceding all three laws in importance: The exceptional, telepathic robot R. Giskard Relentlov faces a dilemma in which he has to break the First Law to save the Earth. For this higher purpose, Giskard programmes himself into implementing the Zeroth Law which infers the preservation the well-being of humanity; thusly allowing them to hurt human beings.[60]

Basically, Asimov's Laws of Robotics are absolute rules engraved into the circuits of the *positronic brains* of the robots. The laws are generally conceived as the robotic equivalent of morals; conversely they differ from human morals in terms of both context and effect. Asimov's normal robots cannot even think of breaking the laws; a serious dilemma regarding the laws renders a robot forever inoperable, in other words, dead.

Asimov's attitude towards real life robots is indeed intriguing, for at first, he did not think that robots would come into existence[61] but when they did albeit primitively, he continued defending The Laws while hinting a sense of surrender if they prove superior to human beings:

> My own feeling is twofold. In the first place, I don't feel robots are monsters that will destroy their creators, because I assume the people who build robots will also know enough to build safeguards into them. Secondly, when the time comes that robots-machinery in general-are sufficiently intelligent to replace us, I think they should. We have had many cases in the course of human evolution, and the vast evolution of life before that, in which one species replaced another, because the replacing species was in one way or another more efficient than the species replaced. I don't think Homo sapiens possesses any divine right

[60] Isaac Asimov, *Robots and Empire,* (London; HarperVoyager: 1996) p. 504.
[61] Asimov, *The Complete Robot,* p. 10.

> to the top rung. If something is better than we are, then let it take the top rung.[62]

Stanisław Lem criticizes Asimov on his Laws of Robotics in his brilliant article "Robots in Science Fiction"; by stating that the laws limit the idea of artificial humans to the concept of an effectively constructed product:

> I have forgiven Asimov many things, but not his laws of robotics, for they give a wholly false picture of the real possibilities. Asimov has just inverted the old paradigm: where in myths the homunculi were villains, with demoniac features, Asimov has thought of the robot as the "positive hero" of science fiction, as having been doomed to eternal goodness by engineers.[63]

Lem underlines that the master-servant relationship between man and robot is modeled after certain patterns such as the 'good white man' and the 'good-natured black servant' or the master and dog.[64] In accordance with Lem's claims, there are few non-dystopian reversals to these roles. Harry Bates' "Farewell to the Master" (1940) might be considered as one. At first, Gnut, the greenish metallic robot of the story is of unknown origin, since it arrives in an ovoid means of transportation out of nowhere. Gnut has a human being alongside who calls himself Klaatu right before he is killed by a madman. As the story unfolds, the reader is inclined to think that Gnut is a weird but kind robot with suggestions that it might capable of emotion and deep thought; [65] still, it is the altruistic robot which desperately tries to

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[62] Earl G. Ingersoll, Isaac Asimov, Gregory Fitz Gerald, Jack Wolf, Joshua Duberman, Robert Philmus, A Conversation with Isaac Asimov, *Science Fiction Studies*, Vol. 14, No. 1 (Mar., 1987), pp.68-69.
[63] Lem, "Robots in Science Fiction", p.313.
[64] Lem, "Robots in Science Fiction", p.314.
[65] Harry Bates, *Farewell to the Master*, http://thenostalgialeague.com/olmag/bates.html

revive, -or more precisely, *remake*- its master. Only in the last sentence of the story it is revealed that the robot, Gnut, is the master.[66]

The Second World War, especially the use of atomic bombs, has had an impact on SF which would shape the years to come. The bombings of Hiroshima and Nagasaki showed incontestably how destructive technology could get. After the war, the Iron Curtain would provide a speculation prone Other to the SF authors of the West, thus the late Golden Age would be overrun with alien stories. Jack Williamson wrote *With Folded Hands* right after the WWII, which was published in *Astounding Science Fiction* in 1947; it was followed by a sequel *...And Searching Mind* in 1948.[67] In Williamson's imagined world, *the Mechanicals,* unsophisticated mechanical robots are commonly used for menial jobs such as household chores, are part of normal life until the arrival of a strange new model: *the Humanoids.* Initially, it is yet another story of a scientist with good intentions whose invention goes out of control. Mr. Sledge settles in a remote, partly destroyed planet to build absolutely benevolent machines that could never be used for war or anything that could harm human beings. *The Humanoids* function according to their Prime Directive which reads: *To Serve and Obey, And Guard Men from Harm.* However, these robots interpret this principle as to protect humans from doing anything that cause any physical or mental harm; thusly barring them from almost all activity. Moreover, the humanoids take the initiative to tamper with human minds, in case they are unhappy or restless; for it is their duty to protect the

[66] Bates, *Farewell to the Master.*
[67] The two stories were compiled under the title *The Humanoids.*

humans from themselves as well. Williamson's humanoids are certainly not evil, since they are incapable of hating; but they are not good either as they were designed to be. [68] They're nothing more than the machines with a disastrous production flaw.

A similar approach to automation can be seen in Kurt Vonnegut Jr.'s dystopian novel *Player Piano* (1952), in which the robots take all the menial work rendering the masses idle. Published in the same year, Lester del Rey's "Instinct" recounts dissimilarly of the robot civilization thousands of years after the extinction of the human race. The reason of the disappearance of the humankind is a major research area for the robots; furthermore they try to remake human beings, supposedly for the purpose of studying them. The common belief in robots is that the humans ceased because they could not get rid of their *instincts* when they didn't need them anymore; and since the robots had no instinct they might better themselves as a race and avoid extinction. But when they eventually succeed in making a human being, the master-servant relationship is reestablished instantaneously and the robots *instinctively* start serving him.

Back in the world of science, the first electronic computer E.N.I.A.C. was built in 1946 paving the way to further developments in computing; which interestingly diverged into the possibility of an artificial intelligence after 1950. Alan Turing, a most influential mathematician and computer scientist introduced an imitation game, which would later be called the Turing Test, in his stimulating article "Computing Machinery and

[68] Jack Williamson, *The Humanoids* (New York: Tom Doherty Associates,1996), p.293.

Intelligence" (1950). The game roughly requires a machine and a human agent to interact with a human interrogator who has the role to decide which player is the human one, via typed questions and answers. Turing proposes that if the machine can imitate a human so successfully that the interrogator picks it as the human player, then it is, in fact, a thinking machine. The philosophical implications of the game will be discussed in the next chapter, however it has to be highlighted that a significant part of the AI developed since were tried with and failed the Turing Test, although Turing was highly optimistic about future computers passing the test[69]. Furthermore, 'passing' as human – as in Judith Butler's terminology – hence has become an increasingly popular theme in fiction on human artifice.

In the following decades, the robot fiction spread exponentially, not only in literature but also in cinema and TV; even into different narrative mediums such as graphic novels and animation. Yet there are relatively few appearances of mechanical characters in such mediums until 70s. In Fritz Lang's *Metropolis* (1927), the worker class is portrayed as parts of the *M-Machine*, in accordance with the zeitgeist. Moreover, the *Machine Man (der Maschinenmensch),* which is introduced as a female robot, then transforms into a duplicate of one of the main characters, Maria. The

[69] "I believe that in about fifty years' time it will be possible, to programme computers, with a storage capacity of about 10^9, to make them play the imitation game so well that an average interrogator will not have more than 70 per cent chance of making the right identification after five minutes of questioning." Alan Turing, "Computing Machinery and Intelligence", *The Turing Test,* ed. Stuart Shrieber (Cambridge, Massachusetts; MIT Press: 2004) p. 76.

Maschinenmensch in its final form is a succubus, sinister and tempting in appearance, with a matching role in the plot.

Likewise, James Whale's movie adaptation of *Frankenstein* (1931) depicts the Being as inherently evil since Henry Frankenstein unintentionally uses the brain of a violent criminal for his creation. The movie differs fundamentally from the novel in many aspects; for instance, compared to Victor Frankenstein of the novel, Henry is much befitted to the mad scientist archetype –similar to Rotwang of *Metropolis*. Furthermore, the monster lacks the ability to speak though it is capable of making sound, in contrast with the speaking monster of *Bride of Frankenstein* (1935). Whale's sequel also returns the remorse element, which was completely ignored in the first movie, to Frankenstein's character to an extent. Henry's second creation is not exactly like his first, for the brain of the Bride is artificially developed. The Bride is only shown in the final scene of the movie and she is depicted hardly as hideous as the monster.

Robots in early film are almost never benevolent; they are most usually tools with no will of their own. *The Day the Earth Stood Still* (1951) is loosely based on Harry Bates' "Farewell to the Master". The movie introduces the robot character Gnut as part of a mechanical race which was built as a police force for the galaxy. In the 1956 movie *Forbidden Planet,* Robbie the robot is of same nature: It solely does what it is ordered to do except for hurting humans, for it is bound with a safety factor similar to the Laws of Robotics. Although slightly more sympathetic

than its contemporaries, Robbie is described as 'a tool, a tremendously strong one'.[70]

It was not only the robot trope which became stale by early sixties; most of the SF published was revolving around same *nova* the same way. This tendency broke soon with the *New Wave* which marks a stylistic change influenced by the *nouvelle vague* of French cinema as well as a surge and variation of novelty in content.

From the perspective of a reader, it would not be wrong to claim that SF has become harder to comprehend past the Golden Age. For what once was conceived exclusively in the territory of SF has become part of ordinary life with TV sets, satellites, space missions and elementary versions of computers and robots. Aside from the experimentalism in style and *nova,* The Cold War and the Mutually Assured Destruction (MAD) doctrine infused fear and paranoia into SF.

SF was developing on the east side of the Iron Curtain as well. Polish writer Stanisław Lem became a prominent figure in sixties. Lem mused plentifully on robots; his *Star Diaries* (1957), *Cyberiad* (1965) and *Mortal Engines* (1961) are collections of intricately written fables in most of which robots are the norm, and humans are mythological relics of an ancient and distant past. *Return From the Stars* (1961) and *Futurological Congress* (1971) and several others have featured some robots as well. Lem's fiction differs from those of his Western predecessors for which the robot

[70] *Forbidden Planet,* dir. Fred M. Wilcox, perf. Walter Pigeon, Anne Francis and Leslie Nielsen, Metro Goldwyn Mayer, 1956.

commonly is a selfless machine, since he believes that "a being so similar psychically to a human being is, considered ethically, a human being.[71]"

On the other hand, Philip K. Dick, another exceptional literary figure in sixties who has created increasingly human-like machines in his fiction, draws the line between what he calls "human" and "android" when he proclaims the latter to be "a cruel and cheap mockery of the former for base ends."[72] Though dismissed as an "outright failure" by Darko Suvin[73], *Do Androids Dream of Electric Sheep?* (1968) (hereinafter referred as *Androids*) is fairly efficient in blurring the limits of genuine and imitation. In Dick's realm, the sole issue is not the ersatz; there is also the reification of the living. As an instance, in Androids*,* albeit empathy is presented as the main lack of the android; people depend on mood organs and empathy boxes –mechanical devices that stimulate the brain into predetermined emotional experiences. For Dick, the android and the schizoid human fall into the same category since both lack "proper empathy or feeling."[74]

Interestingly, works of fiction on immobile artificial intelligence usually deal with a unique computer, like the automaton stories of 19th century; among which there are several stories of Isaac Asimov including "Think!" (1977), "Point of View" (1975) and "True Love" (1977), or Robert A. Heinlein's *Moon is a Harsh Mistress* (1965). In most of pre-cyberpunk SF, robots are manufactured as thinking machines but computers

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[71] Lem, "Robots in Science Fiction*",* p. 320
[72] Philip K. Dick, "Man, Android, Machine", *The Shifting Realities of Philip K. Dick: Selected Literary and Philosophical Writings,* (New York; Pantheon Books: 1995) p. 149.
[73] Darko Suvin, "P.K. Dick's Opus: Artifice as Refuge and World View (Introductory Reflections)", *Science Fiction Studies*, 2:1 (Mar., 1975): p. 20.
[74] Dick, "Man, Android, Machine", p. 147.

develop self awareness spontaneously. In *Moon is a Harsh Mistress* the HOLMES FOUR type computer Mike installed to foresee the lunar penal colony *wakes* into self awareness after the number of his *neuristors* –which can be considered as the digital equivalent of neurons– augments through hooking into more and more hardware systems to one and a half times the neurons a human brain has.[75] Through interaction with human beings Mike comes to understand and apply some human concepts such as humor, friendship and gender; he creates a few personas that play key roles in the revolt of the colony.

Heinlein's Mike is a perfect thinking machine in relation to Turing's approach; it yearns for humanity and it passes as human except for the few people with whom he shares his secret existence. On the other hand, Roger Zelazny's novelette "For a Breath I Tarry" (1966) puts the lack of an organic body as an ultimate bar from being human. Frost, the highly developed self-aware machine that is responsible over half of the Earth long after the extinction of the Man, cannot quench its curiosity for humanity through studying what was left of Him. For Zelazny, it is the organic perceptions that cause feeling an emotions; a machine can accurately measure temperature but cannot feel the cold.[76] Hence, unlike Mike, Frost fails to comprehend human conceptions; art, for instance. Eventually, Frost and the machines under his command succeed in growing blank-brained human bodies and into one of those Frost transfers the matrix of its awareness. The transfer process itself resembles remarkably to birth; the

[75] Robert A. Heinlein, *Moon is a Harsh Mistress* (London: Gollancz, 2008), p. 12.
[76] Roger Zelazny, *For a Breath I Tarry,* http://www.kulichki.com/moshkow/ZELQZNY/forbreat.txt%7C

first feelings that Frost experiences are fear and despair due to light, noise and other immeasurable perceptions.[77] Those feelings mark the humanity of Frost and the machine race immediately start protecting and serving him.

John Sladek, the author of *Roderick, or The Education of a Young Machine* (1980), *Roderick at Random* (1983) and *Tik-Tok* (1983), muses with the conception of humanity. The Roderick novels are the story of a boy which happens to be a robot; recounting his story till adulthood. Initially, Roderick looks barely human; still he passes as a disabled child with a defense mechanism that makes him claim that he's a robot. Roderick is not made to imitate a child; he does exactly what a child does growing up. Yet *Tik-Tok*, whose name is inspired by L. Frank Baum's mechanical character in the Oz universe, is a sinister robot who liberates himself off of his "Asimov Circuits" and commits crimes just for the tick. These two special robots of Sladek are significant among most others because they don't aspire to be human: they are aware of their difference and but they do not think themselves as 'fake'. In other words, these characters do not have the 'Pinocchio Syndrome', which makes most fictional artificial beings to seek for a mode of existence other than their own.

Sladek's materialist approach to humanity might be considered as novel in the historicity of SF, but it must be noted that the scientific context was more suitable in eighties for such an approach. In late seventies, personal computers became commercialized and industrial robots came into use –thus channeling more attention and endeavor into robotics; those

[77] Zelazny, *For a Breath I Tarry.*

developments were followed by personalized portable technological objects, Bruce Sterling points out, such as the Walkman, the portable telephone and soft contact lens.[78] In such a world emerged the Cyberpunk, a subgenre which is considered to be rather extrapolative compared to the speculative New Wave. [79]

> The cyberpunks are perhaps the first SF generation to grow up not only within the literary tradition of science fiction but in a truly science-fictional world. For them, the techniques of classical "hard SF" –extrapolation, technological literacy–are not just literary tools but an aid to daily life. [80]

The impact of the cyberpunk is of major importance for this dissertation; certain precursors might have paved the way to a more complex relationship of man and machine, but it was the cyberpunk which revolutionized that relationship and set human body forth as a locus for SF.

> Certain central themes spring up repeatedly in cyberpunk. The theme of body invasion: prosthetic limbs, implanted circuitry, cosmetic surgery, genetic alteration. The even more powerful theme of mind invasion: brain-computer interfaces, artificial intelligence, neurochemistry –techniques radically redefining the nature of humanity, the nature of the self.[81]

The novel that ushered cyberpunk, William Gibson's *Neuromancer* (1984), contains most of the nova presented by Bruce Sterling above: AI, digitally stored personalities, several sorts of body modification, sense sharing, cyberspace et cetera. Connecting to the cyberspace is a sublime experience for the protagonist Case, for when he loses his ability to do so,

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[78] Bruce Sterling, "Preface", *Mirrorshades: the Cyberpunk Anthology*, (New York: Arbor House, 1986), p. xi.
[79] Carl Malmgren , quoted in Brooks Landon*, Science Ficton After 1900: From Steam Man to the Stars,* (New York and London: Routledge, 2002) p. 159.
[80] Sterling, Preface to *Mirrorshades*, p. ix.
[81] Sterling, Preface to *Mirrorshades*, p. xi.

he considers himself a prisoner in his own flesh.[82] It is interesting that in such a context that a mind could be uploaded to a matrix, or a person's consciousness could be digitally saved with keeping the sensations it entails[83]; the artificial intelligence's status is dubbed with uncertainty. The artificial intelligence Wintermute is self-aware but fairly less concerned with human attributes in comparison to its precedents in SF.

Neuromancer does not offer a pure technophile utopia; the cyberspace for which Case yearns is also dangerous and menacing. Adam Roberts formulates this as a "distinctively double-edged attitude to the machine." [84] In general, this attitude is part of cyberpunk; usually manifested as a cautious acceptance towards the machine –Japanese animation series *Ghost in the Shell* for instance, and sometimes as the fight with it; for which *Dark City* (1998) and *the Matrix* trilogy might be considered as examples. Cyberpunk had a distinctive impact on SF as a genre so that a significant part of the SF written afterwards which had machine – man dichotomy is somehow marked by the ideas, concepts and attitudes introduced by the movement, as Scott Bukatman describes:

> Cyberpunk proved to be a revitalizing force in science fiction, fusing the literary values and technological expertise which had previously been disported into separate subgenres. Although the movement ended almost as soon as it began, leaving a motley assortment of short stories and novels, its impact has been felt, and its techniques absorbed, across a range of media and cultural formations. Perhaps we should not regard this movement as a closed literary form, but rather as the site where a number of

[82] William Gibson, *Neuromancer,* (London; Harper-Collins: 1995) p. 12.
[83] Dixie's ROM construct explains: "Well it feels like I am [sentient], kid, but I'm really just a bunch of ROM. It's one of them, ah, philosophical questions, I guess…" in Gibson, *Neuromancer*, p. 159.
[84] Roberts, *Science Fiction,* p. 169.

> overdetermined discursive practices and cultural concerns were most clearly manifested and explicated.[85]

Still, the change within SF had begun with the New Wave. Another notable precursor of cyberpunk is Ridley Scott's movie *Blade Runner* (1982), based on the novel *Do Androids Dream of Electric Sheep?* Compared to the novel, the movie follows a totally different path depicting the androids, which are overtly more sympathetic in the movie. Ridley Scott's androids can develop human emotions given time; but that very time is taken from them by their developers in order to prohibit them from rebellion –to which they still resort, in order to survive first.

Blade Runner did not do well at the box office when it was released in 1982, but it has become a cult movie in time, especially among SF enthusiasts. Ridley Scott's 1979 movie *Alien* features an android character as well: Ash is an immoral robot; his only loyalty is to his employers. The sequel *Aliens* (1986) which is directed by James Cameron, presents another android character, Bishop. The protagonist of both movies, Ripley distrusts Bishop because of her encounter with Ash; Bishop nevertheless ensures her that he is a higher model compared to Ash, since he has *behavioral inhibitors* which keep him from harming a human being.

James Cameron's follow-up to Alien is probably due to his enormous success with *the Terminator* (1984) which is mostly an action movie disguised as SF with considerably less estranging effect. In the Terminator, its three sequels and the TV series adaptation *the terminator* is presented as a cyborg though the only character that falls into this category is the one in

[85] Scott Bukatman, *Terminal Identity* (Durham and London: Duke University Press, 1993), p. 137.

the yet latest movie of the series –*Terminator Salvation* (2009). The original terminator has organic skin that is grown in the laboratory, which makes it rather an android in contrast with Marcus Wright in *Terminator Salvation*, who used to be a normal human before his cyborgization.

It is obvious that the Hollywood film industry has been using robot, android and AI themes excessively; there are numerous films that contain such elements, yet the nature of those beings and how they are different are usually evaded with superficial explanations or predetermined suppositions. A weird combination of Western and SF, *Westworld* (1973) is such an example, in which the robots are built to simulate certain characters in a high-tech adult theme park. They are presented as "highly complicated equipment"[86] yet they somehow go beyond their programming and become the people they were designed to harmlessly imitate. In *Stepford Wives* (1975) the androids that replace the women in Stepford are rather similar to automata, although there is not much focus on the extent of their intelligence or the existence of any agency in them. The extremely popular *Star Wars* saga might provide further example: the sentient robots C3PO and R2D2 play major roles in the Star Wars storyline, yet their ontological category is not a contested issue; neither in text, nor critically.

On the other hand, TV series *Star Trek: The Next Generation* [Star Trek: TNG] and Japanese animation series *Ghost in the Shell* [GiTS] have dealt more attentively with the human – machine dichotomy. Lieutenant Commander Data in Star Trek TNG is a one-of-a-kind android with a

[86] *Westworld,* dir. Michael Crichton, perf. Yul Brynner, Richard Benjamin and James Brolin, Metro Goldwyn Mayer, 1973.

consistent side story in the main storyline in which he seeks to become human. In the Star Trek universe where sentiency is not limited to humans, it is certainly interesting that Data aspires for humanity exclusively, and that he is the only *Starfleet Officer* to prove his sentiency in a trial.[87] Similarly, *Ghost in the Shell* animated TV series and movies –based on the manga [graphic novel] series of Masamune Shirow with the same title– probe into *cyberization* which is an ordinary part of this imagined cyberpunk version of Fukuoka. All the main characters in *GiTS* are cyborgs to an extent; the main character Motoko Kusanagi is a talented full body cyborg that cherishes an old watch as the only relic of her organic body. The limits of self are highly contested in *GiTS* saga; the scientifically detectable 'ghost' is the hallmark of being human though it is possible to disjoin it with the body. More importantly, there's the *Tachikoma*, self aware machines in form of small battle tanks, which develop unexpectedly into sentience and question their own existence. Although the *tachikoma* are of pure artificial origin; it is revealed by the end of the *GiTS: Stand Alone Complex 2nd Gig* that they indeed have developed ghosts.[88] Therefore, the ghost doesn't refer exactly to the Judeo-Christian conception of soul, for it is not intrinsic, nor exclusive to the human beings; moreover it can be *hacked* or *dubbed.*

Japanese SF generally has an intriguing quality of adopting but perverting Western notions. The first appearance of the robot in Japanese

[87] "The Measure of a Man", *Star Trek: The Next Generation,* CBS, Paramount Television, Los Angeles, 11 February 1989.
[88] "Return to Patriotism – ENDLESS∞GIG", *Ghost in The Shell: Stand Alone Complex 2nd Gig*, Nippon TV, Production I.G., 8 January 2005.

SF is with the serialization of Osamu Tezuka's *manga Astro Boy* [Tetsuwan Atomu] in 1952. At that time, Western SF was infested with either selfless, tool-like robots or malicious robots. On the other hand, Astro Boy was a superhero. Since sixties Japan has produced significant amounts of works of SF on the human artifice mostly in forms of *manga* and *anime* [animated series or movies], which admittedly require further research.

The works of fiction that are presented in this chapter are only a segment of what there really is. Nevertheless, this chapter serves to hint to an understanding on how the human artifice evolved in SF from the patched up human in Frankenstein to the fully organic androids, in accordance with the technological development. Overlooking the fiction that probes into the existence of the human artifice, it is inferable that the boundary between human and machine is drawn differently through time and according to the cultural context. The robots of fiction, which at first were generally bereaved of intelligence, self, or consciousness, started to behave more humanlike in time. Still, a limit –however obscure or insignificant it may be– remained between those two entities which are deemed as intrinsically different.

In the next chapter, the fundamental discussions on the human mind and its implications on the assumed essence to being human is going to be discussed, accompanied with critical analyses of select SF texts some of which were introduced in this chapter.

3. The Human Artifice and its Implications

"I think, Sebastian, therefore I am."
Pris – *a replicant.*[89]
"I, myself, exist, because I think-"
QT-1 – *a robot.*[90]
"I think, therefore I am."
James Moriarty – *a sentient program*.[91]

The question of what exactly we are is probably older than history. The curious case of being human, being the sole *intelligent* species –in our own terms– which uses languages, builds cultures and civilizations, conceptualizes all there is to see and beyond, has intrigued not only philosophers and scientists, but also common folk. Countless answers have been offered to the questions such as what animates living matter or how we are different from all the animals and vegetation. This has not been a culture-specific concern, in all the ancient cultures as well as the modern cultures, the human nature and its uniqueness has been addressed somehow. There is an ever-present, fundamental need to explain our existence, most of the times in comparison with other living beings; and throughout the history myriad explanations have arisen.

It is indeed interesting, that for many Eastern and Western, ancient and modern cultures; the answer lies in an immaterial self. Referred as the

[89] An organic android in *Blade Runner*. Dir. Ridley Scott. Perf. Harrison Ford, Rutger Hauer, Sean Young. Warner Bros., 1982.
[90] Isaac Asimov, "Reason", *The Complete Robot,* p. 285
[91] A *Holodeck* simulation program which was made to act as Arthur Conan Doyle's famous character Professor James Moriarty, "Ship in a Bottle", *Star Trek: The Next Generation,* CBS, Paramount Television, Los Angeles, 23 January 1993.

soul, spirit, *anima* and so on, the immaterial self is usually considered as an immortal core, unlike our bodies which eventually die and perish. For instance, in *Phaedo*, Plato asserts that we have pure, noble, immortal souls which existed earlier "before entering human form, apart from bodies; and they possessed wisdom."[92] Learning, according to Plato, is mere recollection when in human form. The idea of an intrinsic, inherent essence to being human has been dogmatized by major Western religions[93] and it has often been associated with human intelligence. However, especially after Enlightenment, the idea of an immaterial, immortal core has been contested and mostly abandoned in the philosophical and indeed scientific scene. Today in dominant discourses 'the soul' refers to so much more than what it refers in Judeo-Christian tradition; it may correspond to mind, self, emotions, the 'heart', etc.

It is much of a broad subject to delve into, though it is important to point that some explanations –mostly ancient ones– do not mention of a specific *human soul* but spirits that animate all the living; on the other hand, the explanations which have had the biggest impact on Western SF indeed do. In the last few centuries, this discussion is mainly held between two camps and their ramifications: those who propose that the mind is in relation to but distinct from the body, and those who deny such a distinction. And even though the dualist approach has been challenged by many; the possible existence of an artificial being remained problematic.

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[92] Plato, *Phaedo,* Trans. David Gallop (New York: Oxford Clarendon Press, 2002), p. 24

[93] The immaterial self exists in Eastern philosophies as well, but indeed differently from the Judeo-Christian tradition. For further reading: David P. Barash, *Ideas of Human Nature : from the Bhagavad Gita to Sociobiology*. Upper Saddle River, N.J.: Prentice Hall, 1998

SF authors who write on artificial humans draw their base assumptions from within their own cultural context, though they do not necessarily present those assumptions explicitly for categorizing those non-human beings in their imagined universes. In fact, most of the fiction which do not directly address the issue of the nature of the artificial or altered human, take the preset SF tropes on those beings and elude the question. Furthermore, since SF as a genre is on bad terms with metaphysics, the authors do not usually yield to the given concept of soul, instead, they tend reason their categorization with notions derived from the conception of mind, such as consciousness, emotions, empathy, intentionality.

In the upcoming subchapters I will first discuss the possibility of an artificial mind in SF with reference to the perennial philosophical dispute on the philosophy of mind and the relatively recent advancements in cybernetics. In the second subchapter, the organic android and its possible shortcomings will be examined. For this chapter, only the more recent samples from SF will be discussed for the sake of emphasizing the exceedingly liminal character of the human artifice in SF.

3.1. The possibility of an Artificial Mind

The human nature has indeed been on the table long before primitive automata had been engineered or SF problematized “artificial beings” in contrast with the human being. On that aspect, the sole issue hasn’t been the explanation to our intelligent existence, but also questions

have been asked whether humans are inherently good, bad or equal for instance. Still, technological development and pop-culture conceptions of artificial beings have had significant impact on the debate about our particular position among the species. It is important to denote that it is not my purpose to introduce every argument that has been developed within the philosophy of mind in this subchapter. I will rather pick the most prominent approaches and crucial concepts on the subject that can be articulated to the fiction available, since admittedly, only a fragment of what has been discussed in the philosophy of mind can be traced in SF. Furthermore, SF, philosophy and cybernetics basically deal with different questions on the human artifice; for SF, the stake is broader than thinking or having a mind; instead it is the concept of being human which the artifice faces. Hence, there are some arguments on being human that do not appear in science or philosophy; those will be left for the second subchapter in which the organic android will be discussed.

As stated before, the approaches towards the issue of what makes us human can be categorized in two; reserved that those categories encompass contradicting arguments: *Dualism* refers to the separation of mind and body, and *monism* argues against that. Although dualism in some form has been present in many texts throughout the history, it won't be wrong to claim that it was in its prime when Descartes proposed thought as the basis of his existence. He is, in his own words, "a thing that thinks"[94]. Though it seems as Descartes is referring to being a mind, which might have been

[94] René Descartes, *Meditations on First Philosophy, with Selections from the Objections and Replies,* Trans. and Ed. John Cottingham (Cambridge: Cambridge University Press, 1996), 67.

considered as a monist argument, he accepts the existence of a corporeal body as well:

> […] on the one hand I have a clear and distinct idea of myself, in so far as I am simply a thinking, non-extended thing; and on the other hand I have a distinct idea of body, in so far as this is simply an extended, non-thinking thing. And accordingly, it is certain that I am really distinct from my body, and can exist without it.[95]

In his *Discourse on the Method of Rightly Conducting One's Reason and Seeking Truth in the Sciences* (1637), Descartes postulated parallelisms between the automaton and animal only to draw the conclusion that animals are machine-like, though on the other hand, humans are not.

> This will not seem strange to those who know how many different automata or moving machines can be devised by human ingenuity, by using only very few pieces in comparison with the larger number of bones, muscles, nerves, arteries, veins, and all the other parts in the body of every animal. They will think of this body like a machine which, having been made by the hand of God, is incomparably better structured than any machine that could be invented by human beings, and contains many more admirable movements. I specifically posed to show that, if there were such machines with the organs and shape of a monkey or of some other non-rational animal, we would have no way of discovering that they are not the same as these animals. But if there were machines that resembled our bodies and if they imitated our actions as much as is morally possible, we would always have two very certain means for recognizing that, none the less, they are not genuinely human. The first is that they would never be able to use speech, or other signs composed by themselves, as we do to express our thoughts to others. For one could easily conceive of a machine that is made in such a way to utter words, and even that it would utter some words in response to physical actions that cause a change in its organs – for example, if someone touched it in a particular place, it would ask what one wishes to say to it, or if it were touched somewhere else, it would cry that it was being hurt, and so on. But it could not arrange words in different ways to reply to the meaning of everything that is said in its presence, as even the most unintelligent human beings can do. The second means is that, even if they did many

[95] Descartes, *Meditations,* p. 102.

> things as well as or, possibly, better than any one of us, they would infallibly fail at others. Thus one would discover that they did not act on the basis of knowledge, but merely as a result of the disposition of their organs. For whereas reason is a universal instrument that can be used in all kinds of situations, these organs need a specific disposition for every particular action. It follows that it is morally impossible for a machine to have enough different dispositions to make it act in every human situation in the same way as our reason makes us act.[96]

As Jaegwon Kim denotes, "the idea of minds as souls or spirits, as entities or objects of a special kind, has never gained a foothold in a serious scientific study of the mind and has also gradually disappeared from philosophical discussions of mentality"[97]; nevertheless, *substantial dualism* has occupied the philosophical scene long enough to have its own legacy in dominant discourses. In SF, the boundary between human and machine is almost never explicitly based on an immaterial self, even though robots, androids and alike are often dismissed as "soulless machines". One rare example that presents the commonsense conception of soul as robot's lack is Barrington J. Bayley's *The Soul of the Robot* (1974). The protagonist, Jasperodus, is an exceptional robot in a world where robots are common but as slaves to men. He is made by an elderly couple as a son, though the first thing he does is to disparage them and leave. *The Soul of the Robot* is the story of Jasperodus trying to find himself. He is obviously different from all the robots and sees himself as equal to humans but this attitude is never reciprocated. Jasperodus himself can see the difference between men and robots:

> Robots were ghosts of men, shells of men, mimicking men's conduct thought and feeling. In a human being, on the other

[96] René Descartes, *Discourse on Method and Related Writings,* Trans. Desmond M. Clarke (England: Penguin Classics, 1999), pp.40-41
[97] Jaegwon Kim, *Philosophy of Mind* (Colorado: Westview Press, 1996), p.3.

> hand, even in the most stupid there was some indefinable inner spark, sensed rather than seen, that made him a man. [98]

Jasperodus repeatedly claims that he has a soul, argues that he's self-aware, that he possesses consciousness but his efforts are retorted by assertions that his sensations are merely simulations; they are not genuine. In the end, it is revealed that Jasperodus indeed possessed a soul and is a fully conscious being, "a person": His soul is the amalgamation of half the souls of his parents, transferred to his mechanical body via some technical secret.[99] Bayley's outright assertion that a soul is required to have genuine consciousness is very hard to come by in SF since this sort of metaphysical agency derails SF into the realm of fantasy. Other fiction in which we see hints of Cartesian legacy mostly point at somewhere else whilst positioning the existence of artificial being.

In one of Asimov's early stories, "Reason" (1941), the prototypical robot QT-1 concludes through "concentrated introspection" that it, itself, exists because it thinks. [100] It also deduces that there must be a master, *The Master* to be precise, "who created humans first as the lowest type" but then replaced them with robots which are superior beings with their sturdy bodies. It proclaims itself as a prophet and the energy converter for which they work as the Master. Other robots in the off-world Solar Station starts following it, adopting its belief. As in most of Asimov's fiction, "Reason" brings out a curious robot story mildly challenging the given conception of the robot but not to debunk it. It is clear that *Cutie* or QT-1 shows some

[98] Barrington J. Bayley, *The Soul of the Robot* (New Jersey: Cosmos Books, 2001), 114.
[99] Bayley, *The Soul of the Robot*, p. 202.
[100] Isaac Asimov, "Reason", *The Complete Robot,* p. 281.

humanlike qualities, such as the capability "deducing Truth from *a priori* causes;" [101] it even shows signs of anger. Still, it has not completely abandoned the Three Laws: it does for what it is manufactured to do; only thinking that it is doing its job to please The Master, not the humans. Robots quoting or following the footsteps of Descartes while questioning their existence is not uncommon in SF since especially in post – Golden Age SF, logical thinking or reasoning is much generally considered as an artificially attainable human attribute. Perhaps it is because they are created in man's own image, it seems as though natural for them to follow man's path in finding out about their nature.

The main opposition to Cartesian dualism emerged from among the materialists, to nobody's surprise. Julien Offray de la Mettrie took on the dualists and penned a grim critique, *Man a Machine* [L'Homme Machine] (1748), in which he disclaimed the dualist conception of soul by stating it is "therefore but an empty word, of which no one has any idea and which an enlightened man should use only to signify the part in us that thinks"[102]. De la Mettrie takes on the automaton analogy of Descartes (which is quoted earlier) as well, but to a different end:

> To be a machine, to feel, to think, to know how to distinguish good from bad, as well as blue from yellow, to be born with an intelligence and a sure moral instinct, and to be but an animal, are therefore characters which are no more contradictory, than to be an ape or a parrot to be able to give oneself pleasure…. I believe that thought is so little incompatible with organized matter, that it seems to be one

[101] Bayley, *The Soul of the Robot*, p. 296.
[102] Julien Offray de la Mettrie, *Man a Machine* (Chicago: Open Court Publishing, 1912), p. 128.

> of its properties a par with electricity, the faculty of motion, impenetrability, extension, etc.[103]

Materialism developed into *physicalism* in 20th century for which today both terms are interchangeable; but the 18th century materialism is followed rather among current *reductionists* or *reductive physicalists. Physicalism,* or minimal physicalism to be precise, is marked by three principles according to Kim: First is the mind-body supervenience which means "that any two things (objects, events, organisms, persons, etc.) exactly alike in all physical properties cannot differ in respect of mental properties"[104]. Follows the basic rejection of mental substances or pure mental properties, in other terms the "anti-Cartesian principle"[105] and the mind-body dependence principle which affirms supervenience and asserts that the 'mental' depends on the 'physical.'[106] If all mental states can be reduced to physical states, then an artificial mind might be possible in case human physical states could be crafted into it. This standpoint gained importance after the emergence of computer science and cybernetics. Those who argue that "it is physically possible to build and program a computer so that the computer exhibits cognitive processing among problem types"[107] formed the *Strong AI* camp.

Curious enough, basic materialist approach is not widely popular either in SF; it is rather hard to find a robot character that is unreservedly

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[103] La Mettrie, *Man a Machine*, pp.143-144.
[104] Kim, *Philosophy of Mind,* p. 10.
[105] Kim, *Philosophy of Mind*, p. 11.
[106] Kim, *Philosophy of Mind*, p. 11.
[107] Ryan Nichols, Nicholas D. Smith, Fred Miller, *Philosophy Through Science Fiction* (New York and London: Routledge, 2009), p. 265.

human in behavior. One relative work is that of John Sladek: *Roderick or The Education of a Young Machine* (1980) and its sequel *Roderick at Random or Further Education of a Young Machine* (1983) are satirical SF novels which follow the materialist path to the robotic imagination. Sladek much probably is inspired by Alan Turing's argument on the learning machine when he conceived Roderick, a sentient child robot. Turing asserts that a machine could be built to simulate human behavior closely, but it should be built in a way that it could learn from its mistakes and should be "educated" properly.[108] Roderick is such a robot, abandoned by the university project that developed him (it is gendered as a "he") and his first family, eventually given to a family which raised him as their son. Initially, Roderick does not look human at all, for which he passes as a disabled kid contrary to his will. Unlike in the majority of robot fiction, Roderick does not aspire to become human; he openly insists that he's a robot, so that he is taken to have a personality disorder by his teachers and classmates. In fact, Sladek uses Roderick to satirize popular robot fiction. For instance he is given Asimov's *I, Robot* to read by Father Warren –the principal of the church school to which he attends– , for Roderick to understand that he could not be a robot; he is merely a disabled boy:

> Roderick was in his room reading *I, Robot,* wondering when the I character was going to put in an appearance. There must be one, because otherwise the author would have called it *He, Robot* or *They, Robots.* He couldn't imagine how it would feel,

[108] Alan M. Turing, "Intelligent machinery, A Heretical Theory", *The Turing Test,* pp.106-107. He also suggests that "there should be two keys which can be manipulated by the schoolmaster, and which represent the ideas of pleasure and pain." Ibid., p. 108.

> being hooked up to these three terrible laws of robotics, that-[109]

Roderick's mind is not different from a normal boy's; and though his body is that of metal and plastic, he is equipped with mechanical equivalents to human sensations. Roderick's sensations might not be exactly the same with the human ones, but that does not *count* as a lack in Sladek. The difficulty of replicating mental states constitutes the main body of counterarguments towards materialism, or specifically towards its reductionist branch. Among the arguments that have been proposed, those that focus on *consciousness, qualia,* and *intentionality* are to be roughly discussed hereinafter.

Consciousness is a problematic concept; it much certainly lights a bulb in everyone, but it can hardly be defined objectively, as Putnam puts it out, consciousness is "a philosopher's stand-in for more substantial words." [110] Consciousness can be taken as practically synonymous to thought[111] or awareness,[112] or more generally as the possession of certain qualities including "feelings, thoughts, attitudes and character traits." [113] Although the concept itself is nebulous in regard to all the assumptions it indicates; consciousness is often treated as a *sine qua non* human quality.

> Consciousness is the central fact of specifically human existence because without it all of the other specifically human

[109] John Sladek, *The Complete Roderick* (Woodstock and New York: The Overlook Press, 2004), p. 227.
[110] Hilary Putnam, "Robots: Machines or Artificially Created Life?", *The Journal of Philosophy,* 61:21, American Philosophical Association Eastern Division Sixty-First Annual Meeting (Nov. 12, 1964): 668.
[111] Tim Crane, *The Mechanical Mind* (London: Routledge, 2003), p. 27.
[112] Kim, *Philosophy of Mind,* p. 155
[113] Putnam, "Robots", p. 668.

> aspects of our existence – language, love, humour, and so on – would be impossible.[114]

In SF, consciousness is also sometimes associated with being alive; commoditized robots are not considered as life forms since they merely follow programming. It is indeed interesting that consciousness is only rarely attributed to all living beings in current cultures, but it might be set as a condition to being alive in SF. What we associate with consciousness also entails the *qualia* problem. *Qualia* are the "the phenomenal, qualitative characters of our experiences"[115] which are deemed to be intrinsic, subjective, and obviously nonreplicable. In "For a Breath I Tarry", Roger Zelazny lets a machine describe qualia to another sentient machine as such:

> "Regard this piece of ice, mighty Frost. You can tell me its composition, dimensions, weight, temperature. A Man could not look at it and do that. A Man could make told which would tell Him these things, but He still would not *know* measurement as you know it. What He would know of it, though, is a thing that you cannot know."
> "What is that?"
> "That it is cold," said Mordel and tossed it away.
> "'Cold' is a relative term."
> "Yes Relative to Man."
> "But if I were aware of the point on a temperature scale below which an object is cold to a Man and above which it is not, then I, too, would know cold."
> "No," said Mordel, "you would possess another measurement. 'Cold' is a sensation predicated upon human physiology."
> "But given sufficient data I could obtain the conversion factor which would make me aware of the condition of matter called 'cold'."
> "Aware of its existence, but not of the thing itself."
> "I do not understand what you say."
> "I told you that Man possessed a basically incomprehensible nature. His perceptions were organic; yours are not. As a result of His perceptions He had feelings and emotions. These often gave rise to other feelings and emotions, which in turn caused others, until the state of His awareness was far removed from the objects which

[114] Searle, *Minds, Brains and Science,* p.14.
[115] Kim, *Philosophy of Mind,* p. 236.

> originally stimulated it. These paths of awareness cannot be known by that which is not-Man.
> Man did not feel inches or meters, pounds or gallons. He felt hear, He felt cold; He felt heaviness and lightness. He *knew* hatred and love, pride and despair. You cannot measure these things. *You* cannot know them. You can only know the things that He did not need to know: dimensions, weights, temperatures, gravities. There is no formula for a feeling. There is no conversion factor for an emotion."[116]

Arguments on *qualia* have been used so frequently in SF that the lack of feelings -or sensations in general, has become part of the robot trope. Even if the imagined robot possesses consciousness, this incapability to know *qualia* might constitute the ground for its subhuman status. If we take it one step further and conceive a conscious, pseudo-organic android who can *know qualia*; there is still the issue on being programmed or not. Henceforth another keyword that probes into the possible existence of an artificial mind: *intentionality.* John Searle, a materialist who opposes reductionism asserts that intentionality is "the feature by which our mental states are directed at, or about, or refer to, or are of objects and states of affairs in the world other than themselves"[117]. It is Searle's *Chinese Room Argument* which constitutes the most founded opposition against Strong AI. Chinese Room Argument is basically a thought experiment in which Searle presupposes himself to be in a room performing tasks on batches of Chinese scripts according to given Rules written in English. For Searle, Chinese symbols are indistinguishable from 'meaningless squiggles'[118] and he can only tell them apart by shape. Still, if he performs the task according to the

[116] Zelazny, *For a Breath I Tarry.*
[117] Searle, *Minds, Brains and Science,* p. 14.
[118] John R. Searle, "Minds, Brains and Programs", *The Turing Test,* p. 203.

set of Rules, or *"the program",* his response is the same as any native Chinese speaker – although they mean nothing to him.[119] From outside the box, Searle might seem as if he understands Chinese, since his performance simulates that of a native speaker; but in fact he does not understand a symbol, what he does is not *intentional.* Therefore a program in a digital computer cannot be exactly like a mind and even if a computer passes as human by passing the Turing test; that will not mean that the computer is conscious.

Above arguments entail further questions on how our mind works and our awareness of our inner processes as well. In "Robots: Machines or Artificially Created Life?" (1964) Hilary Putnam argues that those inner processes might not necessarily differ with a human and a robot. He presupposes that the robot fulfils the conditions that "(1) it uses language and constructs theories; (2) it does not initially 'know' its own physical make-up, except superficially; (3) it is equipped with sense organs, and able to perform experiments; (4) it comes to know its own make-up through empirical investigation and theory construction"[120]. He also asserts that a robot "may be psychologically isomorphic to a human without being at all similar in physical-chemical construction".[121] According to Putnam it is possible for such a robot to have a 'sensation' of 'red' when it utters a statement that something is red. Furthermore, "for any sense in which a human can 'know that he has a sensation' there will be a logically and

[119] Searle, "Minds, Brains and Programs", p. 203.
[120] Putnam, "Robots", p.671.
[121] Putnam, "Robots", p. 681.

semantically analogous sense in which a robot can 'know' that he has a 'sensation'.[122]

> There is not the slightest reason for us, either, to believe that "consciousness" is a well- defined property, which each robot either has or lacks, but such that it is not possible, on the basis of the physical description of the robot, or even on the basis of the psychological description […], to decide which (if any) of the robots possess this property and which (if any) fail to possess it.[123]

It is also essential to point out that Searle theorizes without Putnam's presuppositions mainly focusing on digital computers, and he accepts that if a man-made machine "with a nervous system, with neurons and dendrites, and all the rest of it, sufficiently like ours"[124], it could think. What he refuses is that there can be mechanical equivalents for human sensations, hence making the artificial mind hardly possible.

However, as it is quoted from Russ in the introduction of this dissertation, SF is "What If literature". Current cybernetics is still far from building a self-aware AI, but SF authors are less concerned with empirical boundaries in comparison with the philosophers. In SF, it is much easily possible to conceive of an android that can pass as human both in appearance and behavior. The android might be self aware, it might question its existence, or even, it might be unaware of its artificial nature thinking that it is human. In such cases, where does the android stand categorically? The answers inevitably come in a variety through time and among authors. In the following paragraphs, two major works will be

[122] Putnam, "Robots", p. 674.
[123] Putnam, "Robots", p. 689.
[124] Turing, "Minds, Brains and Programs", p. 217.

evaluated in this aspect: Asimov's robot novels, TV series Star Trek: The Next Generation.

Isaac Asimov introduces the "humaniform" robot Daneel Olivaw in *The Caves of Steel* (1954) who also appears in other robot novels such as *The Naked Sun, The Robots of Dawn, Robots and Empire* as well as in some Foundation novels. Daneel is a painstakingly crafted robot which is indistinguishable in appearance from any other human being. Furthermore, he can mimic human behavior to an extent; still, he cannot perceive *qualia*, he does not have feelings and most importantly he is bound with the Three Laws of Robotics which serve as the ultimate safeguard against the Frankenstein Complex in Asimovian universe. From the robot's standpoint, the Three Laws pose a limitation even on the thought patterns; a robot is not capable of thinking about breaking the laws.

While the Three Laws boil down to a control mechanism which bars the possibility of a robot with a genuine free will; the robot's potential is perceivable in Asimov's fiction, which includes numerous cases that depend on the robot's interpretation of the Three Laws. Furthermore, the robot's understanding of any concept is determinant on the implementation of the laws. For instance, in *Robots and Empire*, common servant robots of the planet Solaria are able to attack humans from other worlds because their conception of human requires them to speak in Solarian accent.

> It is the encoding of the abstract concepts implied in the laws within the huge space of possible environments that seems to make this task insurmountable. Many of Asimov's story lines emerge from this very aspect of the Three Laws even as many of their finer points are glossed over or somewhat naïve assumptions are made regarding the cognitive capacity of the

> robot in question. A word encountered by a robot as part of a command, for example, may have a different meaning in different contexts. This means that a robot must use some internal judgment in order to disambiguate the term and then determine to what extent Three Laws apply.[125]

Asimov himself exhibits a slight change of mind in a span of almost half a century. One might claim that his robots became more unpredictable in time, making their cases more borderline than it used to be. An indication to that change is the presentation of the Zeroth Law in *Robots and Empire*, which was explained in the first chapter. The significance of the appearance of the Zeroth Law might be attributed to the fact that it is initiated by Daneel and R. Giskard Relentlov, another *special* robot, instead of it being programmed into their positronic brains. Furthermore, the Zeroth Law of protecting humanity is ipso facto problematic considering the robot's positronic brain and its minefield, as Daneel expresses:

> In theory the Zeroth Law was the answer to our problems. In practice, we could never decide. A human being is a concrete object. Injury to a person can be estimated and judged. Humanity is an abstraction.[126]

Even though some of Asimov's robots can exhibit some form of complex thought or behavior, Asimov's work still leans on the more conservative approach to robotic existence. In *Foundation and Earth,* Daneel is twenty thousand years old in Asimovian timeline. He certainly has evolved to a certain degree in that time, but he still is merely a robot; as a character explains Daneel's status whilst a discussion on the intelligence

[125] Lee McCauley, "The Frankenstein complex and Asimov's Three Laws", http://www.aaai.org/Papers/Workshops/2007/WS-07-07/WS07-07-003.pdf p.11.
[126] Isaac Asimov, *Foundation and Earth* (New York: Bantam Books, 2004), p. 486.

of robots and Gaia, a planet marked with a collective consciousness which encompasses all living and non-living things:

> Robots are the creation of human beings, and Gaia is the creation of robots –and both robots and Gaia, insofar as they must be bound by the Three Laws, have no choice but to yield to human will. Despite the twenty thousand years Daneel has labored, and the long development of Gaia a single word from Golan Trevize, a human being, would put an end to both those labors and development. It follows then, that humanity is the only significant species of intelligence in the Galaxy and psychohistory remains valid.[127]

A significant part of the post-Golden Age authors are not as reserved as Asimov towards robot sentiency. Gene Roddenberry's iconic TV series *Star Trek: The Next Generation* is such a work of fiction. Lieutenant Commander Data, a sentient android who serves for the Starfleet, has his own side story on *becoming human* throughout the TV series and movies of Star Trek: TNG saga. Data might be considered as the epitome of the android's longing towards humanity, perhaps on par with Andrew Martin from Asimov's "The Bicentennial Man". But in Data's case, it is indeed intriguing that among the myriad sentient species that the crew of Enterprise encounters through years, Data yearns only for humanity, that one thing which he himself deems unattainable. When Data is asked by his artificially created daughter Lal on why he still tries to emulate humans when it only serves to remind him that he's incomplete, he explains as follows:

> I have asked myself that many times as I have struggled to be more human, until I realized that it is the struggle itself that is most important. We must strive to be more than we are Lal. It

[127] Asimov, *Foundation and Earth*, p. 497.

> does not matter that we will never reach our ultimate goal. The effort itself yields its own rewards.[128]

Data's existence and its implications are somewhat puzzling in the context of the series. As stated before, human characteristics are not universal among the species of this imagined universe, and any sentient life form is sacrosanct. Nevertheless, Data's sentiency and his existence as a life form are contested several times throughout his story. For Dr. Ira Graves, a scientist acquainted with Data's maker, Data's existence "must be a kind of walking purgatory; neither dead nor alive, never really feeling anything, just existing."[129] On the other hand, for most of his crew mates, Data's difference in perception does not debunk the fact that he is, indeed, a life form. In the episode "The Measure of a Man", a Starbase Captain proclaims Data as a piece of computer equipment and hence a property, which must be disassembled to do reverse engineering on his mechanism. Data resorts to justice and they hold a prosecution to determine his sentiency. Captain Jean-Luc Picard, who is assigned to defend Data, affirms that humans "too are machines, just machines of a different type."[130] When the question of what is required for sentience is brought to the table, Starbase Captain Bruce Maddox proposes intelligence, self-awareness and consciousness[131] as hallmarks of sentiency. He accepts that Data is intelligent, and he cannot refute that Data, who speaks of "his right

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[128] "The Offspring", *Star Trek: The Next Generation,* CBS, Paramount Television, Los Angeles, 10 March 1990.
[129] "The Schizoid Man", *Star Trek: The Next Generation,* CBS, Paramount Television, Los Angeles, 21 January 1989.
[130] "The Measure of a Man", *Star Trek: The Next Generation.*
[131] "The Measure of a Man", *Star Trek: The Next Generation.*.

to choose" and "his life", is not self-aware or conscious. The decision of the officer who presides over the trial concludes as follows:

> "It sits there looking at me. I don't know what it is. This case has dealt with metaphysics, with questions best left to Saints and philosophers. I'm not competent, nor qualified to answer those. [….] Is Data a machine? Yes. Is he the property of Starfleet? No. We've all been dancing around the basic issue: Does Data have a soul? I don't know that he has; I don't know that *I* have. But I have got to give him the freedom to explore that question himself. It is the ruling of this court that Lieutenant Commander Data has the freedom to choose."[132]

Now it is of importance to denote that *Star Trek: TNG* draws some concepts from Asimovian legacy such as the presumption that an android is made to serve; or for instance the fact that Data possesses a *positronic brain* -the term itself is conceived by Asimov. Still, Data's borderline case often blurs the limit between man and machine unlike with Asimov's robots. Data's behavior implies that he's more than what he deems himself to be for which he and his crew mates are often puzzled, even though Data seems to remain oblivious to his quasi-human traits.

Initially, Data is often intrigued by certain human concepts which he presumes that he can only *know* by definition: feelings, humor, dreams and such. In his case, human sensations are not strictly nonreplicable; for instance, his *father* Doctor Noonien Soong is able to make a chip with which Data can experience "basic emotions and simple feelings."[133] In the episode "Descent: Part I", he experiences his first feeling, which is, anger. He states that he has "no frame of reference in order to confirm [his]

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[132] "The Measure of a Man", *Star Trek: The Next Generation.*.
[133] "Brothers", *Star Trek: The Next Generation,* CBS, Paramount Television, Los Angeles, 8 October 1990.

hypothesis, in fact [he is] unable to provide a description of the experience"[134] but that hardly disproves that he experienced a human emotion of which Geordi La Forge, a human, fails to offer a description without referring to other sensations.

Data's quest on becoming human is not a simple Pinocchio story; on the contrary, his existence serves to deconstruct what we take for granted on being human.

> "If being human is not simply a matter of being born in flesh and blood, if it is instead a way of thinking, acting and feeling, then I am hopeful that one day I'll discover my own humanity. Until then [….] I will continue learning, changing, growing and trying to become more than what I am."[135]

Data's synthetic body makes him unable to *know* certain *qualia* such as the taste of water or the sensation of touch; but are those features constitute the *sine qua non* element for being human? Would a human being with a disability to experience bodily pain be subhuman or nonhuman in any sense? The closest Data claims that he gets to humanity is in the movie *Star Trek: The First Contact,* in which he experiences the sensation of touch. In the movie, the Borg Queen grafts a patch of organic skin on Data's forearm as a tempting offer. Data experiences pain when that skin is cut; and when the Borg Queen blows on the hair on that skin, he experiences pleasure. The movie itself can not be considered in compliance with the Star Trek: TNG canons on Data and the Borg. It is fairly inane for the authors to assume that a *positronic* brain combined with

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[134] "Descent: Part One" *Star Trek: The Next Generation,* CBS, Paramount Television, Los Angeles, 21 June 1993.
[135] "Data's Day" *Star Trek: The Next Generation,* CBS, Paramount Television, Los Angeles, 7 January 1991.

organic skin makes Data able to have human sensations while the same brain is not able to perceive touch if the skin is synthetic. Still, although naively, it implies that for some, our physical build is what makes us human.

3.2. The Machine in an Organic Body

In the previous chapter, we have seen that even if an approach on mind does not postulate a distinction between mind and body; there is still the tendency to refer to mental and physical properties, since perhaps "the mental seems so utterly different from the physical and yet the two seem intimately related to each other."[136] For many, such as dualists, there cannot be an artificial mind. A computing device can be built to emulate human behavior but it would be a 'mere simulation'. Furthermore, not all physicalists are open to the idea that an android might be *a person*, setting forth a broader sense of thinking which encompasses perceptions and feelings for instance. Similarly, there is a significant amount of fiction in which the 'thinking robot' is lacking because of its bodily differences.

In this subchapter, I'll probe into the issue of having an organic body and whether it is a satisfying basis for humanity in SF. Consequently, the androids of this subchapter will be more liminal in build: Philip K. Dick's androids, the *replicants* of *Blade Runner*, *cylons* of the Reimagined TV Series *Battlestar Galactica* and finally, Asimov's Andrew Martin.

[136] Kim, *Philosophy of Mind,* p. 7.

In most of the early robot fiction, the robotic imagination was mostly limited to moving metal chunks. There were some significant exceptions including R.U.R; still, the fact that being a robot entails being a servant –or a *slave* to be politically incorrect– brought upon the commoditization of robot bodies. For that reason, the robots were conceived to be built according to the necessity; such robot characters were developed enough to fit their masters' needs; although their bodies were commonly stronger and more durable than that of a human. Those first robots and the significant amount of fictive robots that followed, lacked the parts of human anatomy which were deemed unnecessary for the tasks they were built to fulfill. Furthermore, there are the sentient computer stories in which there is the total lack of a body and any sensation that entails. For those machines, the body or the lack thereof generally constitutes an impediment on their advances towards the human condition; as illustrated several times before.

Along with the technological development, the robots of SF most generally started looking more human. As they were made to look like human beings, they were started get called 'androids.' However, a machine with a pseudo-human face and humanlike movement usually tinted the stories with hints of the uncanny in Freudian sense, which is:

> The uncanny [*unheimlich*] is something which is secretly familiar [*heimlich-heimisch*], which has undergone repression and then returned from it, and that everything that is uncanny fulfils this condition.[137]

[137] Sigmund Freud, *The Uncanny.* http://www-rohan.sdsu.edu/~amtower/uncanny.html.

Let us not forget that it is not the android that evokes the uncanny; on the contrary, it emerges from the presuppositions and their implications of the author –not even the fictive character– vis-à-vis the humanlike machine. One might argue that it is the machine in the human, the one thing that most authors persistently elude, which makes the android uncanny. Whatever the reason may be, the uncanny in android stories most usually cause the authors to resort to the artificial – genuine binary or invent new criteria for being human.

In fiction, the tendency to ground the android's artificiality on its programming is fairly related to the intentionality debate discussed earlier. Even though the android has the capacity to think or feel, those attributes might be dismissed as fake on the basis of it being a simulation. As Baudrillard explains, this is not a simple question to be answered, especially considered the unknowable nature of an android:

> To dissimulate is to feign not to have what one has. To simulate is to feign to have what one hasn't. One implies a presence, the other an absence. But the matter is more complicated, since to simulate is not simply to feign: "Someone who feigns an illness can simply go to bed and make believe he is ill. Some who simulates an illness produces in himself some of the symptoms." (Littre) Thus, feigning or dissimulating leaves the reality principle intact: the difference is always clear, it is only masked; whereas simulation threatens the difference between "true" and "false", between "real" and "imaginary". Since the simulator produces "true" symptoms, is he ill or not? He cannot be treated objectively either as ill, or as not-ill.[138]

For Philip K. Dick, the simulated existence of an android gets into the spotlight with his overemphasis on empathy. In the post-apocalyptic

[138] Jean Baudrillard, *Simulations,* Trans. Paul Foss, Paul Patton and Philip Beitchman (USA: Semiotext[e], 1983), p. 5.

setting of *Do Androids Dream of Electric Sheep? (Androids),* Dick introduces androids as an incentive to people who is allowed to (and would comply to) emigrate from the crippled Earth; in other words, they are slaves.

> The TV set shouted, "—duplicates the halcyon days of the pre-Civil War Southern states! Either as body servants or as tireless field hands, the custom-tailored humanoid robot—designed specifically for YOUR UNIQUE NEEDS, FOR YOU AND YOU ALONE—given to you on your arrival absolutely free, equipped fully, as specified by you before your departure from Earth; this loyal, trouble-free companion in the greatest, boldest adventure contrived by man in modern history will provide—" It continued on and on.[139]

Dick's *andys* are not silicon clad robots; they're synthetic organisms; physiologically advanced to the degree of *almost human.* One major bodily difference underlined in the novel is the short life span of the androids[140], which means ostensibly, one cannot tell an android apart from a human being. The most certain way to determine the latest model androids' artificial nature is to conduct a bone marrow test.[141] The androids are equipped with self-awareness, albeit they are built into servitude. Furthermore, with every new model, the android would become more humanlike in intelligence as well, which would make it harder to distinguish them.

> The Nexus-6 android types, Rick reflected, surpassed several classes of human specials in terms of intelligence. In other words, androids equipped with the new Nexus-6 brain unit

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[139] Philip K. Dick, *Do Androids Dream of Electric Sheep?* (New York: Del Rey Books, 1996), pp. 17-18.
[140] Rachael Rosen of Rosen Corporation, a Nexus-6 type android, talks about this issue: " They could never solve that problem. I mean cell replacement. Perpetual or anyhow semi-perpetual renewal. Well, so it goes. […] Anyhow it keeps humans from running off and living with an android." (Dick, *Do Androids*, p. 197.)
[141] Dick, *Do Androids*, p. 32.

> had from a sort of rough, pragmatic, no-nonsense standpoint evolved beyond a major −but inferior− segment of mankind.[142]

Androids is the story of Rick Deckard, a bounty hunter employed by the San Francisco Police Department, whose job is to retire *andys*. Retirement is indeed a euphemism for the killing of the android. It is puzzling that the retirement scenes throughout the novel are written in such a manner that an inattentive reader might forget that these androids are organic. In fact, Dick deliberately and exclusively uses expressions which would divert the attention from the android's established physical nature and reduce it to its artificiality. Instead of mentioning body parts and blood, Dick chooses to depict the deaths with statements like "the android burst and parts of it flew"[143], "the brain box burst" and "reflex circuits in the corpse made it twitch and flutter".[144]

In order to detect fugitive *andy*s which pose as human on Earth, Deckard uses a method that is based neither on physiology nor intelligence: Voigt-Kampff test scales the uncontrollable facial reactions of the subjects to a set of questions about certain social situations, which is supposed to discern empathy. The method forthwith triggers a question: What exactly is empathy, and is it something measurable? Empathy is presented as a sacred human concept in *Do Androids;* the major human religion, *Mercerism,* is also based on it. In Mercerism, all emotions are to be shared with other humans scattered on Earth and the colonies. As much like anything else in

[142] Dick, *Do Androids*, p. 30.
[143] Dick, *Do Androids*, p. 144.
[144] Dick, *Do Androids*, p. 145.

this realm, Mercerism's empathy is acquired with a device, and *andys* don't seem to be compatible with it.

> Empathy, evidently, existed only within the human community, whereas intelligence to some degree could be found throughout every phylum and order including the arachnids. For one thing, the emphatic faculty probably required an unimpaired group instinct; a solitary organism, such as a spider, would have no use for it; in fact it would tend to abort a spider's ability to survive. It would make him conscious of the desire to live on the part of his prey. Hence all predators, even highly developed mammals such as cats, would starve. Empathy, he once had decided, must be limited to herbivores or anyhow omnivores who could depart from a meat diet. Because, ultimately, the emphatic gift blurred the boundaries between hunter and victim, between the successful and the defeated.[145]

One can therefore infer that Dick's understanding of empathy involves a moral imperative. In further analysis, Voight-Kampff test is composed of questions which bear moral inclinations, usually a detail about killed or mistreated animals.[146] In fact, androids fail to mimic instant reactions to discursively disturbing stimulus, more or less because they're not brought up in that discourse, they're brought into it by human beings. Moreover, the reliability of the test is questioned throughout the story; the test fails to pass schizophrenic human subjects; it barely registers Nexus-6 types and even *normal* humans can react like *andys.* Dick, in accordance with his style, deliberately blurs his established limits between human and *ersatz* throughout the novel.

> The line between the 'real' and 'fake' is already tenuous in a world where an empathy box is '*the most personal possession you have!... an extension of your body'* and the truth of emotional experience lies with the machinery that verifies it;

[145] Dick, *Do Androids*, pp. 30-31
[146] With most of the animals extinct, the animals have become sacrosanct and any thought of harm to them is similar to blasphemy.

> nonetheless, we are asked to accept emotion as the foundation of reality.[147]

Still, the limit is reestablished by the end of the novel: The androids are "chitinous reflex machines"[148] which are "essentially *less* than human"[149] because they do not respect life other than their own. In contrast, Blade Runner, although based on Do Androids, treats the *replicants* quite differently.

> [...] the main difference, and the one that subverts the central theme of the novel, is in the treatment of the androids. Dick makes it clear that his androids, no matter how sympathetic some of them appear, are radically evil because they lack souls. The movie, ironically, takes a more humanistic approach to the androids, or Replicants, and presents them as victims of human evil. The Replicants are capable of murder but even so they emerge, by the end of the film, as morally as well as physically superior to their human hunters."[150]

The novel establishes that androids are intrinsically lacking in regard to Dick's conception of empathy. On the other hand, the replicants of the Blade Runner are barred from attaining unnecessary human characteristics:

> Bryant: They were designed to copy human beings in every way except their emotions. But the designers reckoned that after a few years they might develop their own emotional responses: hate, love, fear, anger, envy… So they built in a failsafe device.
> Deckard: Which is what?
> Adam: Four year life span.[151]

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[147] Kevin McNamara, "'Blade Runner's' Post-Individual Worldplace", *Contemporary Literature,* 38: 3, (Autumn, 1997):440 (The italics are quoted from the book, p. 58)
[148] Dick, *Do androids*, p. 169.
[149] Quoted from Dick in Paul Sammon, "The Making of Blade Runner" Cinefantastique 12: 5-6 (July- Aug.,1982): 26.
[150] Paul Sammon, "The Making of Blade Runner", p. 40.
[151] *Blade Runner*.

Even with the failsafe mechanism, the *replicants* are not completely left to the domain of subhuman. They are intelligent, curious and determined to live freely and longer than Tyrell Corporation allows them to be. They cherish the fake memories that are programmed into them like a normal human would. They merely are "emotionally inexperienced".[152]

> They are abstracted versions of human beings who lack families, childhoods, and the sense of being part of the human situation upon which all human beings, including Deckard, depend. Without these encumbrances, life becomes unbearable, so the corporation that manufactures replicants has begun to implant memories into them, creating 'a cushion, a pillow for their emotions' in order to control them better.[153]

In this context, *Blade Runner* is one of the few unorthodox SF texts which refer to the android's past and its implications. SF authors and even some philosophers deem emotions or sensations in general to be intrinsic; but may some of those be learned? How much of *our* sensations are learned? In *Blade Runner* there is the possibility that the android might develop emotions with the accumulation of experiences; therefore there is no insurmountable limit concerning the android's humanity except the fact that he *has to* develop those emotions. Roy Batty, the most fearful and cold of all *replicants*, spares Deckard's life during the climactic fight scene in the end of the movie. Batty then succumbs to his short life span and dies. In the voice-over, Deckard ends the movie as follows:

> "I don't know why he saved my life. Maybe in those last moments he loved life more than he ever had before. Not just his life-anybody's life. My life. All he'd wanted were the same

[152] *Blade Runner.*
[153] Cyrus R. K. Patell, Screen Memory: Androids and Other Artificial Persons, *Harvard Review,* No: 3 (Winter 1993): p. 28.

> answers the rest of us want. Where do I come from? Where am I going? How long have I got?"[154]

Another significant concept that manifests in several SF texts on the human condition is *mortality.* When it is an empirical fact that humans do whatever they can in order to prolong their lives, why would something like mortality show up as what makes us human? Some authors might argue that mortality bridges the gap between androids, infinitely durable machines, and us, perishable machines. Some, on the other hand, presume that the time limit makes life more substantial, hence the android which could die would know the value of life.

In the episode titled "Time's Arrow: Part One" of *Star Trek: TNG*, Data faces the probability of his own death by finding his severed head in a ruins site, apparently placed there by an anomaly in the space-time continuum. He finds the foreknowledge of his death "comforting", elaborating that "it provides a sense of completion to [his] future. In a way, [he is] not that different from anyone else."[155]

> "I have often wondered about my own mortality, as I have seen others around me age. Until now it has been theoretically possible that I would live an unlimited period of time. Although some might find this attractive, to me it only reinforces the fact that I'm artificial."[156]

The same pattern appears in the Reimagined *Battlestar Galactica* TV series. The *cylons* of *Battlestar Galactica* are an artificial race, with both robotic members, (*Centurions,* for instance) and organic androids

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[154] *Blade Runner*.
[155] "Time's Arrow: Part One", *Star Trek: The Next Generation,* CBS, Paramount Television, Los Angeles, 15 June 1992.
[156] "Time's Arrow: Part One."

produced in 12 models. The organic *cylons,* or "skin jobs" as they are frequently referred by human beings, are extremely hard to tell them apart from humans; although their minds work partially differently from the human mind, they are intelligent, self-aware and capable of emotion. Throughout the series, the most fundamental argument for the subhuman status of *cylons* is that they are *programmed* into feeling; a fact accepted by both humans and *cylons*.[157] Furthermore, the *cylons'* free will and even self-awareness might be hindered by their programming. Still, the *cylons'* struggle to "exceed their programming"[158] is one of the main themes of the series, which is demonstrated in several occasions.

The interesting particularity in *Battlestar Galactica* is, when *cylons* die, they normally *download* their consciousness into bodies identical to theirs. This system, which is called *resurrection*, reduces death to a traumatizing experience that switches bodies but the consciousness and memories remain the same. The process remarkably resembles to the trauma of birth, and the *cylons* experience this trauma over and over for it is a norm of their existence. Twice in the series the rebel *cylons* allow or offer the destruction of their resurrection system: first a resurrection ship which follows the *cylon* fleet in deep space, and then the hub which functions as a control center in the system. With the resurrection hub destroyed, all the *cylons* would lose the ability to transfer their consciousness into new bodies. The coordinates to the hub is proposed to the humans as an act of

[157] "Rapture", *Battlestar Galactica,* Sci-Fi Channel, British-Sky Broadcasting, British Columbia, 21 January 2007.
[158] "Six of One", *Battlestar Galactica,* Sci-Fi Channel, British-Sky Broadcasting, British Columbia, 11 April 2008.

trust in the episode "Guess What's Coming To Dinner"*;* but most humans view it advantageous because after all *cylons* would be their "mortal enemies."[159] Natalie, a *cylon* model number 6, explains to the Quorum of the remaining humans:

> "In our civil war we've seen death. We've watched our people die, gone forever. As terrible as it was, beyond the reach of the resurrection ships, something began to change. We could feel the sense of time, as if each moment held its own significance. We began to realize that for our existence to hold any value, it must end. To live meaningful lives, we must die and not return. The one human flaw that you spend your lifetime distressing over, mortality, the one thing… well it's the one thing that makes you whole."[160]

Although I find it far-fetched to place humanity in mortality, it certainly is common among SF authors, mostly as an implication of being human as in *Star Trek: TNG* and *Battlestar Galactica*. The concept comes up as the core element in the one story Asimov deemphasizes his canonical assertions: "The Bicentennial Man". This considerably long story has been awarded with both Hugo and Nebula awards, which are highly esteemed in SF.

Initially, Edward is a mechanical household robot, who by chance possesses a unique capacity: creativity. He carves wood "in exquisite fashion,"[161] so that his carvings are considered as works of art. His manufacturer US Robots and Mechanical Men Corporation regards this anomaly as a defect and offers to replace him, just as any corporation would do. Still, his owners cherish (and profit from) Andrew's talent, hence they

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[159] "Guess What's Coming to Dinner?", *Battlestar Galactica,* Sci-Fi Channel, British-Sky Broadcasting, British Columbia, 16 May 2008.
[160] "Guess What's Coming to Dinner?"
[161] Isaac Asimov, "The Bicentennial Man", *The Complete Robot.,* p. 640.

decide to keep his *positronic* brain intact throughout the years that Andrew's body goes through repairs and replacements. The artist robot comes to learn more about humanity and his own existence; thusly he comes to yearn for freedom, which is supposed to be an empty word for a normal Asimovian robot by the fact the concept itself being in contradiction with the Second Law. How he announces that yearning also constitutes ground that he is aware of and complying with the fact that he's a commodity: "I wish to buy my freedom, Sir."[162] Still, the system does not bar him from his freedom; the judge presiding over the lawsuit decides that "there is no right to deny freedom to any object with a mind advanced enough to grasp the concept and desire the state."[163]

Andrew does not stall after being the first and only free robot on the Earth; his unique status even encourages him further on his arduous advances towards humanity. First, he starts to wear clothes because he feels bare without them.[164] He later on advocates for a basic right for his own kind: the protection of them from harm:

> If a man has the right to give a robot any order that does not involve harm to a human being, he should have the decency never to give a robot any order that involves harm to a robot, unless the human safety absolutely requires it. With great power goes great responsibility, and if the robots have Three Laws to protect them, is it too much to ask that men have a law or two to protect robots?[165]

Although Andrew's efforts are fruitful and the end results might be considered as groundbreaking in Asimovian universe, his one wish is far

[162] Asimov, "The Bicentennial Man", p. 644
[163] Asimov, "The Bicentennial Man", p. 646.
[164] Asimov, "The Bicentennial Man", p. 649.
[165] Asimov, "The Bicentennial Man", pp. 656 – 657.

from being fulfilled: he cannot *be* a man. It is important to underline that by the time passes, Andrew's mentality becomes increasingly similar to that of a human. Still, he lacks something, which he relates to his appearance. When he's over a century old, he asks US Robots to "replace him[166]" which translates as to supply him with another body. Andrew's attorney argues that his *positronic* brain is the locus of Andrew's personality therefore it is only normal for the *positronic* brain, the owner of Andrew's body, to demand for its replacement.[167] Andrew aims for a drastic change when he asks to be replaced, because the body he asks for is that of an android: humanlike in appearance and texture. It is revealed that the US Robots only prototypically produced some android models but halted the project because "a market survey showed they would not be accepted. They looked too human."[168]

After the operation, Andrew decides to be *a robobiologist,* a term he devises for those who "would be concerned with the working of the body attached to that brain."[169] This new goal signals that Andrew is not satisfied with passing as human; he needs to "be still less a robot."[170] He designs a system to replace his power cell, which he thinks is "inhuman."[171] The new system allows him to eat and drink like people, and its implementation on Andrew's body comes as part of an agreement with which Andrew would allow his designs of prosthetic body parts to be used

[166] Asimov, "The Bicentennial Man", p. 661
[167] Asimov, "The Bicentennial Man", p. 661-662
[168] Asimov, "The Bicentennial Man", p. 662
[169] Asimov, "The Bicentennial Man", p. 665
[170] Asimov, "The Bicentennial Man",, p. 669
[171] Asimov, "The Bicentennial Man",, p. 668

by US Robots on human beings. Hence starts the *cyborgization* of normal humans ensued with its ethical ramifications. A human with any number of prosthetic parts remains within the category of human legally, but Andrew is not granted with full human rights. After all the legal debate on why Andrew cannot be a man, it dawns upon Andrew that he needs to be mortal:

> […] if it is the brain that is at issue, isn't the greatest difference of all the matter of immortality? Who really cares what a brain looks like and or is built or how it was formed? What matters is that brain cells die; *must* die. Even if every other organ in the body is maintained or replaced, the brain cells, which cannot be replaced without changing and therefore killing the personality, must eventually die.
>
> My own positronic pathways have lasted nearly two centuries without perceptible change and can last for centuries more. Isn't *that* the fundamental barrier? Human beings can tolerate an immortal robot, for it doesn't matter how long a machine lasts. They cannot tolerate an immortal human being, since their own mortality is endurable only so long as it is universal. And for that reason they won't make me a human being.[172]

Thus Andrew arranges himself his own death, only after that he is granted with the status of humanity:

> Fifty years ago, you were declared a Sesquicentennial Robot, Andrew. […] Today we declare you a Bicentennial Man, Mr. Martin.[173]

Patricia Warrick claims that "The Bicentennial Man" is significant because the "obvious approach [of] man examining artificial intelligence" is inverted and it is left to the robot "to explore the nature and implications of human intelligence."[174] I am rather reserved on that aspect, since I think

[172] Asimov, "The Bicentennial Man", p. 680
[173] Asimov, "The Bicentennial Man", p. 681.
[174] Warrick, *Cybernetic Imagination,* p. 71.

what Andrew's two century long struggle signifies is not the search for human intelligence; instead it is a somewhat pathologically driven battle for recognition as equal. Alessandro Portelli, who draws an analogy between Asimov's robots and Blacks, claims that "The Bicentennial Man" is one of the stories which "deal with the blurring of man-machine differences for the sake of assimilation." [175] The legal battle of the artificial being for equal treatment has been featured in many works of fiction, including Robert A. Heinlein's "Jerry was a Man" (1947), but in most related fiction, the artificial being stays as is; although in "Bicentennial Man" Edward has to change himself radically.

Indeed, even as the fictional human artifice gets more human, the wall between machine and human usually tends to stand still, sometimes supported with additional bricks to patch where it breaks. Mortality is such a criterion, forcing the android to be physically less than what he is, in order to be considered ontologically more than what he is. In numerous films and stories, the sentient human artifice sacrifices his life in favor of human life in order to prove its humanity.[176] What is the use of the dead human artifice other than perhaps a nostalgic feeling on how *the wall* cracked, and a relief that it was not torn down since the solitary exception that could –in time– take it down, is dead?

[175] Alessandro Portelli, "The Three Laws of Robotics: Laws of Production, Laws of Society", *Science Fiction Studies,* 7:2 (Jul., 1980),: p. 153.
[176] See Robots and Empire, Helen O'Loy, Terminator series, Ghost in the Shell series, etc.

4. Conclusion

On the question of what makes us human, SF takes a different path than cybernetics and most schools of philosophy; in its case, being human usually indicates to something more than thinking or being sentient. In a significant part of the fiction that has been referred in the previous chapters, that *something* is tied to abstractions or conundrums which could hardly be solved in the present; hence rendering the boundary between human and machine ambiguous, even elusive. Still, even a small detail like the widespread employment of the expression "a mere machine" implies that the human artifice is less than human as it is; which means that the limit remains for most of the authors.

Furthermore, the trope in which the human artifice yearns for humanity raises eyebrows as the artifice claims it wants to "be" or "become" human, a term which is supposed to signify a member of a certain species. If it was understood as so in SF, the artifice's desire would be null. On another aspect, is it really the desire of the artifice to be human, or does it belong to someone else? Perhaps it is not the humanity itself that is desirable, instead it is us who need to be exalted. Therefore our fiction is filled with naïve conceptions of humanity, facing which the artifice does not stand a chance.

As in all fiction, SF authors' presumptions rely on the cultural context and conjuncture. Although SF has the potential to estrange us from our binaries; deeply engraved assumptions are hard to leave behind. Still,

from a higher ground, it is clear that the representations of the machine have changed over the time, which might easily be linked to the fact that *we* have become more mechanized or in other terms, *cyborgized.* In a sense, the machine is not as unfamiliar as it used to be; because our relationship with the machine is different than it was in the Cold-War Era. It is thence more understandable that the most recent fiction on the human artifice tend to let go of the orthodox approaches for the man-machine dichotomy.

I, therefore, hold my stance on my hypothesis that humanity is a social construct. Moreover, I anticipate SF to further problematize the subject and estrange us from our long deferred confrontation with the ethical ramifications of the blurred boundaries.

5. Glossary of Terms

Android: A robot with humanlike appearance; sometimes built with organic material.

Artificial Intelligence: The capacity of a computer system to perform tasks which require human intelligence, or in fiction, a computer system which possesses humanlike intelligence.

Automaton (pl. automata): A mechanism, in narrower sense one that is modeled after a living being, which operates relatively by itself.

Cyborg: *Cyb*ernetic *org*anism. A human being with a technologically altered body.

Cyborgization: The process of becoming a cyborg.

Cyberization: Cyborgization in Ghost in the Shell saga.

Cylon: A race of robots, androids and other sentient machines in Battlestar Galactica saga.

Golem: An artificial human being which appears in several legends in Jewish mythology and related fiction.

Human artifice: A general term for fictional artificial beings with humanlike appearance and/or attributes.

Homunculus (pl. homunculi): A miniature or full scale human body developed through practices of alchemy.

Mind – uploading: A method of cyborgization in cyberpunk and fiction inspired thereinafter, which corresponds to the transfer of mind to a computer or cyberspace.

Positronic Brain: Isaac Asimov's concept of robotic brain, which integrates the Three Laws of Robotics to its circuitry.

Replicant: Organic androids of *Blade Runner.*

Robot: A machine which resembles a human being in basic appearance and/or conduct.

Simulacrum (pl. simulacra): A representation of nature; a mechanical one in our context. In some fiction (e.g. Philip K. Dick's *We Can Build You)* the term is used for androids.

6. Bibliography

Primary Works:

Books:

Aldiss, Brian W. "But Who Can Replace a Man?" *Men and Machines; Ten Stories of Science Fiction.*. Ed. Robert Silverberg. New York: Meredith Press, 1968.

Asimov, Isaac. *The Complete Robot.* London: Voyager, 1995.

---. *The Caves of Steel.* London: Voyager, 1998.

---. *The Naked Sun.* London: Voyager, 1998.

---. *The Robots of Dawn.* London: Voyager, 1998.

---. *Robots and Empire.* London: Voyager, 1998.

---. *I, Robot.* London: Voyager, 1998.

---. *Foundation and Earth.* London: Voyager, 1998.

Bates, Harry. *Farewell to the Master.* http://thenostalgialeague.com/olmag/bates-farewell-to-the-master.html. 23 November 2009.

Bayley, Barrington J. The *Soul of a Robot* Maryland: Wildside Press, 2001.

Bierce, Ambrose. *Moxon's Master,* http://www.upword.com/bierce/moxon.html. 04 March 2010.

Butler, Samuel. *Erewhon*. http://www.gutenberg.org/ebooks/1906. 12 December 2009.

Čapek, Karel. *Rossum's Universal Robots.* Trans. David Wyllie. http://ebooks.adelaide.edu.au/c/capek/karel/rur/. 21 April 2009.

Del Rey, Lester. "Helen O'Loy." *Science Fiction Hall of Fame Volume One: 1929-1964.* ed. Robert Silverberg. New York: Tor, 2003.

---. "Instinct." *Men and Machines; Ten Stories of Science Fiction.* 1968.

Dick, Philip K. *Do Androids Dream of Electric Sheep?* New York: Ballantine, 1996.

---. *We Can Build You* London: Vintage Books, 1994

---. *Selected stories of Philip K. Dick.* Introduction by Jonathan Lethem. New York: Pantheon Books, 2002.

Ellis, Edward Sylvester. *The Huge Hunter*. http://www.gutenberg.org/ebooks/7506. 13 February 2010.

Forster, E.M. *The Machine Stops*. http://archive.ncsa.illinois.edu/prajlich/forster.html. 07 June 2010.

Gibson, William. *Neuromancer.* London: Harper-Collins, 1995.

Heinlein, Robert A. *Moon is a Harsh Mistress*. London: Gollancz, 2008.

---. "Jerry was a Man." *Assignment in Eternity.* Riverdale, NY: Baen Books, 2000.

Lem, Stanisław. *Futurological Congress (From The Memoirs of Ijon Tichy),*Trans. Michael Kandel. PA: Harvest Books, 2003.

---. *Mortal Engines.* Trans. Michael Kandel. Michigan: Seabury Press, 1977.

---. *Return From The Stars.* Trans. Michael Kandel. Sydney: Harcourt, Brace Jovanovich, 1980.

---. *The Cyberiad.* Trans. Michael Kandel. Sydney: Harcourt, Brace Jovanovich, 1985.

Sladek, John. *The Complete Roderick.* Woodstock and New York: The Overlook Press, 2004.
---. *Tik Tok.* London: Gollancz, 2001.
Shelley, Mary. "Frankenstein: or, The Modern Prometheus", *Frankenstein : the 1818 text contexts nineteenth-century responses modern criticism.* Ed. J. Paul Hunder. New York and London: Norton, 1996.
Villiers de l'Isle Adam, Auguste, Comte de. *L'Eve future.* http://www.gutenberg.org/ebooks/26681. 13 May 2009.
Vonnegut, Jr., Kurt. *Player Piano.* New York, NY : Dell Publishing, 1999.
Williamson, Jack. *The Humanoids.* New York: Tom Doherty Associates,1996.
Zelazny, Roger. *For a Breath I Tarry.* http://www.kulichki.com/moshkow/ZELQZNY/forbreat.txt%7C. 22 April 2009.

Audio-visual Material:

Alien. Dir. Ridley Scott. Perf. Sigourney Weaver, Tom Skerritt, John Hurt. Brandywine Productions, 1979.
*Alien*s. Dir. James Cameron. Perf. Sigourney Weaver, Michael Biehn. Twentieth Century Fox Corporation,1986.
Artificial Intelligence: A.I. Dir. Steven Spielberg. Perf. Haley Joel Osment, Jude Law. Warner Bros., 2001.
Battlestar Galactica. [TV Series] Creator/Executive Producer Ronald D. Moore. British-Sky Broadcasting, 2004 – 2009.
Battlestar Galactica TV Miniseries. Dir. Michael Rymer. Perf. Edward James Olmos, Mary McDonnell, Katee Sackhoff. Sci-Fi Channel, R&D TV, 2003.
Battlestar Galactica: Razor. Dir. Felix Enriquez Alcala. Perf. Edward James Olmos, Mary McDonnell, Katee Sackhoff. Universal Network Television, 2007.
Blade Runner, Dir. Ridley Scott. Perf. Harrison Ford, Rutger Hauer, Sean Young. Warner Bros., 1982.
Bride of Frankenstein. Dir. James Whale. Perf. Boris Karloff, Elsa Lanchester and Colin Clive. Universal Pictures, 1935.
Cherry 2000. Dir. Steve de Jarnatt. Perf. Melanie Griffith, David Andrews. MGM, 1987.
Forbidden Planet, Dir. Fred M. Wilcox, perf. Walter Pigeon, Anne Francis and Leslie Nielsen, Metro Goldwyn Mayer, 1956.
Frankenstein. Dir. James Whale. Perf. Colin Clive, Mae Clarke. Universal Pictures, 1931.
Ghost in The Shell: Stand Alone Complex. Dir. Kenji Kamiyama. Production I.G., 2002 – 2003.
Ghost in The Shell: Stand Alone Complex 2nd Gig, Dir. Kenji Kamiyama. Production I.G., 2004 – 2005.

Ghost in the Shell. Dir. Mamoru Oshii. Bandai Visual, 1995.
Ghost in the Shell: Innocence. Dir. Mamoru Oshii. Bandai Visual, 2004.
"Jerry Was A Man" *Masters of Science Fiction.* Dir. Michael Tolkin. Perf.Malcolm McDowell. Reunion Pictures, 2007.
Metropolis. Dir. Fritz Lang. Perf. Brigitte Helm, Alfred Abel. Universum Film A.G (UFA), 1927.
Short Circuit. Dir. John Badham. Perf. Ally Sheedy, Steve Guttenberg. Tristar Pictures, 1986.
Star Trek: The Next Generation. [TV Series] Creator. Gene Roddenberry. Paramount Corporation, 1987 – 1994.
Star Trek: First Contact. Dir. Jonathan Frakes. Perf. Patrick Stewart, Jonathan Frakes, Brent Spiner. Paramount Pictures, 1996.
Star Trek: Generations. Dir. David Carson. Perf. Patrick Stewart, Jonathan Frakes, Brent Spiner. Paramount Pictures, 1994.
Star Trek: Insurrection. Dir. Jonathan Frakes. Perf. Patrick Stewart, Jonathan Frakes, Brent Spiner. Paramount Pictures, 1998.
Star Trek: Nemesis. Dir. Stuart Baird. Perf. Patrick Stewart, Jonathan Frakes, Brent Spiner. Paramount Pictures, 2002.
S*tepford Wives*. Dir. Brian Forbes. Perf. Katherine Ross, Paula Prentiss. Fadsin Cinema Associates, 1975.
The Terminator. Dir. James Cameron. Perf. Arnold Schwarzenegger, Michael Biehn. Hemdale Film, 1984.
Terminator 2: Judgment Day. Dir. James Cameron. Perf. Arnold Schwarzenegger, Linda Hamilton, Edward Furlong. Carolco Pictures. 1991.
Terminator 3: Rise of the Machines. Dir. James Cameron. Perf. Arnold Schwarzenegger, Nick Stahl. C-2 Pictures, 2003.
Terminator Salvation. Dir. McG. Perf. Christian Bale, Sam Worthington. The Halcyon Company, 2009.
The Day the Earth Stood Still, Dir. Robert Wise. Perf. Michael Rennie, Patricia Neal. Twentieth Century Fox Corporarion, 1951.
Tron. Dir. Steven Lisberger. Perf. Jeff Bridges, Bruce Boxleitner. Walt Disney Productions, 1982.
Westworld. Dir. Michael Crichton. Perf. Yul Brynner, Richard Benjamin. Metro-Goldwyn-Mayer, 1973.

Secondary Works:
Works on Science Fiction:

Alkon, Paul K. Science Fiction before 1900: Imagination Discovers Technology. New York and London: Routledge, 2002.
Asimov, Isaac. "The Machine and the Robot." Science Fiction: Contemporary Mythology: the SFWA –SRFA Anthology, ed. P. S. Warrick, M. H. Greenberg & J. D. Olander. New York: Harper and Row, 1978.
Bloch, Ernst, Anne Halley, Darko Suvin. "Entfremdung, Verfremdung." *The Drama Review: TDR* 15:1 (Autumn 1970): 120 – 125.

Bruno, Guiliana. “Ramble City: Postmodernism and "Blade Runner."” *October* Vol. 41 (Summer, 1987): 61-74.
Bukatman, Scott.*Terminal Identity.* Durham and London: Duke University Press, 1993
Byers, Thomas B. *“*Commodity Futures: Corporate State and Personal Style in Three Recent Science-Fiction Movies.” *Science Fiction Studies* 14 : 3 (Nov., 1987):326-339.
Carr, Brian. “At the Thresholds of the "Human": Race, Psychoanalysis, and the Replication of Imperial Memory.” *Cultural Critique* No. 39 (Spring, 1998): 119-150
Clareson, Thomas D., ed., *SF: The Other Side of Realism*, Bowling Green, OH: Bowling Green Univ. Popular Press, 1971.
Delany*,* Samuel R. “About Five Thousand One Hundred and Seventy Five Words.” *SF: The Other Side of Realism,* pp.130-147.
Dick, Philip K. *Philip K. Dick Reader.* New York: Citadel Press. 1997.
------. The Shifting Realities of Philip K. Dick: Selected Literary and Philosophical Writings. New York. Pantheon Books, 1995.
Fitting, Peter. “Futurecop: The Neutralization of Revolt in "Blade Runner".” *Science Fiction Studies* 14:3 (Nov., 1987): 340-354.
Freedman, Carl. “Towards a Theory of Paranoia: The Science Fiction of Philip K. Dick.” *Science Fiction Studies* 11 : 1 (Mar., 1984): 15-24.
Forrest, Jennifer. “The Lord of Hadaly's Rings: Regulating the Female Body in Villiers de l'Isle-Adam's "L'Eve future".” *South Central Review* 13: 4 (Winter, 1996): 18-37
Galvan, Jill. “Entering the Posthuman Collective in Philip K. Dick's "Do Androids Dream of Electric Sheep?"” *Science Fiction Studies* 24 : 3 (Nov., 1997): 413-429.
Gerould, Daniel. “Villiers de l’Isle-Adam and Science Fiction.” *Science Fiction Studies* 11 : 3 (Nov., 1984): 318-323.
Gilson, Mark. “A Brief History of Japanese Robophilia.” *Leonardo* 31 : 5 (1998): 367-369
Ingersoll, Earl G. “A Conversation with Isaac Asimov.”*Science Fiction Studies* 14:1 (Mar., 1987): 68-77.
Knight, Damon. *In Search Of Wonder: Essays on Modern Science Fiction* Chicago: Advent Publishers, 1967.
Landon*,* Brooks. *Science Ficton After 1900: From Steam Man to the Stars.* New York and London: Routledge, 2002.
Lem, Stanisław. “Robots in Science Fiction.” *SF: The Other Side of Realism,* pp. 307- 325.
McCauley, Lee. “The Frankenstein complex and Asimov’s Three Laws.” http://www.aaai.org/Papers/Workshops/2007/WS-07-07/WS07-07-003.pdf p.11. 27 March 2011.
McNamara, Kevin R. “"Blade Runner's" Post-Individual Worldspace.” *Contemporary Literature* 38: 3 (Autumn, 1997): 422-446.
Michelson, Annette. “On the Eve of the Future: The Reasonable Facsimile and the Philosophical Toy.” *October*, Vol. 29 (Summer, 1984): 3-20
Nichols, Ryan. Smith, Nicholas D. Miller, Fred, eds. *Philosophy Through Science Fiction*. New York: Routledge, 2009.

Parker, Jo Alyson. “Gendering the Robot: Stanislaw Lem's "The Mask."” *Science Fiction Studies*, 19 : 2 (Jul., 1992): 178-191.
Patell, Cyrus R. K. Screen Memory: Androids and Other Artifical Persons. *Harvard Review*, No. 3 (Winter, 1993): 25-29
Portelli, Alessandro. “The Three Laws of Robotics: Laws of Production, Laws of Society.” *Science Fiction Studies* 7:2 (Jul., 1980): 150-156.
Roberts, Adam. *Science Fiction.* London and New York: Routledge, 2000.
Rabkin, Eric S. “Irrational Expectations; or, How Economics and the Post-Industrial World Failed Philip K. Dick.” *Science Fiction Studies* 15 : 2 (Jul., 1988):161-172.
Silvio, Carl. “Refiguring the Radical Cyborg in Mamoru Oshii's "Ghost in the Shell"” *Science Fiction Studies*, 26 : 1 (Mar., 1999): 54-72
Sterling, Bruce.“Preface”, *Mirrorshades: the Cyberpunk Anthology*, ed. Bruce Sterling. New York: Arbor House, 1986.
Suvin, Darko. *Metamorphoses of Science Fiction: on the Poetics and History of a Literary Genre,* New Haven and London: Yale University Press, 1979.
------. “On the Poetics of the Science Fiction Genre.” *College English,* 34:3 (Dec., 1972): 372-382
------. *P.K. Dick's Opus: Artifice as Refuge and World View (Introductory Reflections)* Science Fiction Studies, Vol. 2, No. 1 (Mar., 1975), pp. 8-22.
Telotte, J.P. *Replications: A Robotic History of the Science Fiction Film.* Urbana and Chicago: University of Illinois Press, 1995.
-----. “Human Artifice and the Science Fiction Film.” *Film Quarterly*, 36 : 3 (Spring, 1983): 44-51
Warrick, Patricia S. *The Cybernetic Imagination in Science Fiction.* Cambridge, Massachusetts and London: MIT Press, 1980.

Works on Philosophical and Historical Background:

Barash, David P. *Ideas of Human Nature : from the Bhagavad Gita to Sociobiology*. Upper Saddle River, N.J.: Prentice Hall, 1998.
Baudrillard, Jean. *Simulations.* Trans. Paul Foss, Paul Patton and Philip Beitchman. USA: Semiotext[e], 1983.
Crane, Tim.*The Mechanical Mind.* London: Routledge, 2003.
Descartes, René. *Discourse on Method and Related Writings.* Trans. Desmond M. Clarke England: Penguin Classics, 1999.
------. *Meditations on First Philosophy, with Selections from the Objections and Replies.* Trans. and Ed. John Cottingham. Cambridge: Cambridge University Press, 1996.
Freud, Sigmund. *The Uncanny*. http://www-rohan.sdsu.edu/~amtower/uncanny.html. 30 February 2011.
Gunderson, Keith. “Robots, Consciousness, and Programmed Behaviour.” *The British Journal for the Philosophy of Science* 19 : 2 (Aug., 1968): 109 -122.
Hesiod, *Works and Days*. http://omacl.org/Hesiod/works.html.

Hofstadter, Douglas R. and Daniel C. Dennett, Eds. *The Mind's I: Fantasies and Reflections on Self and Soul.* New York: Basic Books, 1981.
Idel, Moshe. *Golem : Jewish Magical and Mystical Traditions On the Artificial Anthropoid* New York: SUNY Series in Judaica, 1989.
Jolley Nicholas, *The Cambridge Companion to Leibniz.* Cambridge University Press, 1995.
Kim, Jaegwon.*Philosophy of Mind.* Colorado: Westview Press, 1996.
La Mettrie, Julien Offray, de. *Man a Machine.* Chicago: Open Court Publishing, 1912.
Leibniz, Gottfried Wilhelm. *Monadologie.* Trans. George MacDonald Ross, 1999. http://www.philosophy.leeds.ac.uk/GMR/hmp/texts/modern/leibniz/monadology/monadology.html.
Masood, Ehsan. *Science and Islam: A History.* London: Icon Books, 2009.
Ovid, *Metamorphoses.* Trans. Horace Gregory.Canada: Macmillan Company of Canada Ltd, 1958.
Plato, *Meno*, Trans. Benjamin Jowett. http://classics.mit.edu/Plato/meno.html.
-----. *Phaedo,* Trans. David Gallop New York: Oxford Clarendon Press, 2002.
Puccetti, Roland. "On Thinking Machines and Feeling Machines.*" The British Journal for the Philosophy of Science* 18 :1 (May, 1967): 39-51
Putnam, Hilary. "Robots: Machines or Artificially Created Life?" *The Journal of Philosophy,* 61 : 21, American Philosophical Association Eastern Division Sixty-First Annual Meeting (Nov. 12, 1964): 668-691.
Schrieber, Stuart, ed. *The Turing Test: Verbal Behaviour as the Hallmark of Intelligence.* Cambridge, Massachusetts: MIT Press, 2004.
Searle, John. *Minds, Brains and Science 1984 Reith Lectures.* (Cambridge; Mass; Harvard University Press, 1984
-----. "Minds, Brains and Programs." *The Turing Test.* pp. 201-224.
Schwartz, Howard. *Tree of Souls:The Mythology of Judaism.* Oxford and New York: Oxford University Press, 2004.
"Tract Sanhedrin 65b" *Babylonian Talmud.* http://www.come-and-hear.com/sanhedrin/sanhedrin_65.html.
Thornbury, Barbara E. "Puppets on Strings and Actors on Floats: Japan's Traditional Performing Arts in a Festival Setting", *The Journal of the Association of Teachers of Japanese,* 26:2 (Nov., 1992): 181-192.
Turing, Alan. "Computing Machinery and Intelligence", *The Turing Test.* pp. 67-95.
-----. "Intelligent Machinery, A Heretical Theory. " *The Turing Test.* pp. 105-116.
Wilkes, Kathleen V. *Is Consciousness Important?* The British Journal for the Philosophy of Science, Vol. 35, No. 3 (Sep., 1984), pp. 223- 243.