

Cartesian Consciousness

an interpretation beyond mind-body dualism

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Introduction

Today, René Descartes is primarily regarded as the philosopher of substance mind-body dualism; the metaphysical question with a dead end on how his immaterial Cogito could causally interact with the material pineal gland in the brain. In reality, Descartes as a scientist was less interested in such a metaphysical question. Until the late seventeenth century, the Aristotelean notion of the soul influenced the works of philosophers, including Descartes. However, Descartes radically broke with this scholastic tradition with the attempt in his *Meditations* to break down the scholastic notion of the soul. For Descartes, the only immaterial entity was the human mind, or the Cogito, as a thinking thing with an intellect and a will. All other Aristotelean life-giving functions of the soul, such as the vegetative and sensitive soul belonged solely to the machinal, material human body, which Descartes illustrated in detail in his *Treatise on Man* and *Passions of the Soul*. Descartes described thought, the human mind, together with the functions of the human body (its internal emotions and perceptions of the external world through the five senses) in terms of consciousness. The metaphysical aspect of mind-body dualism, however, became a point of discussion with Princess Elizabeth in the *Correspondences* and continued among late seventeenth-century and early eighteenth-century philosophers till date, thereby eclipsing Descartes' main project. Despite this, the Cartesian notion of consciousness did influence modern theories of consciousness and is able to give new insights to challenges proposed in our current era with the rise of technology.

In this essay, I will first argue that Descartes naturalized the Aristotelean notion of the soul by ascribing some of its essential functions to the material human body. Descartes proposed a detailed neurophysiology with the pineal gland as the functional center of the mind, as I will

illustrate in more detail. Although Descartes' main aim was to prove the distinction between the scholastic soul and the body, the metaphysical question of how the immaterial mind interacted with the human brain became an important topic that was discussed as the mind-body problem among late seventeenth and early eighteenth-century philosophers. This essentially eclipsed Descartes' main project and his novel notion of the immaterial human mind with an intellect and a will, as a union with the material body with its emotions and external perception. I will argue that Descartes essentially proposed an original notion of the human mind as self-consciousness and that this notion influenced modern neuroscientific and philosophical theories of consciousness. With the rise of artificial intelligent machines and other technological developments, we are confronted with existential questions about what makes us essentially human, to which Cartesian consciousness, as I will argue, may provide refreshing insights.

1. Naturalizing the Soul

These six Meditations contain all the foundations of my physics. But please don't say so, for those who favor Aristotle would perhaps have more difficulty approving of them. And I hope that those who read them will gradually get used to my principles and recognize their truth before realizing that they destroy the principles of Aristotle.¹

- René Descartes

1.1 Aristotelean Soul as a Machine

René Descartes was exposed to scholastic Aristotelian philosophy already in his early educational years at the Jesuit College of La Fleche. This also included ancient philosophy on the soul, which arose with Socrates and Plato and was later dominated by Aristotle for centuries up to the 17th century. More than two thousand years ago, Socrates rhetorically asked, “What is it that, when present in a body, makes it living?” and answered this question with: “a soul”.² A true philosopher, according to Plato, desires to understand Ideas of Things, but this process is hindered by bodily appetites. For Plato, the faculty of reason can get a clearer view on reality when appetites are controlled and nullified. Death is just the release of the soul from the body. The former is divine, immortal and will continue to exist in another dimension, the latter will decompose and vanish. The soul for Plato is tripartite with reason ideally in charge over appetite and spirit, as is illustrated in the Chariot Allegory.³ In this allegory, the charioteer

¹ AT iii, 298. In this thesis, the Adam and Tannery volumes are cited. The citations are abbreviated as AT, followed by the corresponding volume and page numbers. In addition, some more recent translations of Descartes' work are used, all of which may be found in the Bibliography, below.

² *Phaedo* 105c

³ *Phaedrus* 246a–254e

represents the intellect or reason and drives a chariot pulled by two winged horses, a black one, representing bodily desires and appetites and a white one representing one's spirited, courageous character. Based on this allegory, human reason should mediate between these morally good and bad impulses and eventually guide the soul to the truth.

Aristotle was influenced by his tutor's idea of a tripartite soul, but also crucially diverged from this idea by bringing the soul from the heavens down to the earth. The Aristotelian soul is in a sense still tripartite and of a metaphysical nature, but importantly, it is the force that animates the body.⁴ It is the possession of everything that lives, although in different states. A living plant grows, reproduces and therefore possesses a most basic, vegetative kind of soul. Animals not only grow and reproduce, but they can move themselves and can sense and so, in addition to a vegetative soul, also possess a sensitive soul. Aristotle places human reason at the top of this pyramid. Humans not only grow and reproduce, sense and move, they also reason with logic, and therefore have a rational soul (in addition to a vegetative and sensory soul). In *De Anima* or 'on the Soul', Aristotle extensively investigates all human faculties with a view to understand the soul, which includes not only the five external senses, but also inner senses such as reason, motivation, imagination, desire and nutrition.

For Aristotle, soul is to body as form is to matter. It is, however, not a separate immortal entity that acts upon a body. This point is an important point of contrast between Plato and Aristotle. For Plato, the physical world is not the 'real' world, but merely a changing, imperfect, perishable, illusionary reflection of the ultimate reality that exists beyond the physical realm in a spiritual realm, the Realm of Forms or Ideas. Aristotle clearly criticized this Platonic view of reality and supplanted it with his theory of *hylomorphism*. Aristotle does not divide form and

⁴ *De Anima* ii 1, 412a20–1

matter into two realms. Instead, he argues that every physical entity – within our context a human being- consists of two compounds: form (soul) and matter (body); the soul-body hylomorphism. Such a theory consequently leads to a more natural and less metaphysical perspective on the soul when compared with the Platonic tripartite soul. In Aristotle’s view, the soul is not separable from the body, it is not immortal and does not continue to live in another world after the body’s death. In this sense, the soul does not have the capacity to provide the body with life, it is the life-giving capacity of the body.

The Aristotelian soul dominated the work of many philosophers and thinkers for two thousand years, such as Galen and Thomas Aquinas, who consequently influenced Descartes’ ideas about “the seat of the soul” and the passions respectively, as we will see in later chapters. However, Descartes was less concerned with the soul’s metaphysical aspects, such as its immortality or divinity. He re-interpreted Aristotle’s soul not as a scholastic metaphysician, but more as a scientist, a physicist and an anatomist. Descartes introduced his new physics and attempted gradually to naturalize the Aristotelian soul in his six *Meditations*. In the first meditation, Descartes invites his reader to the *Meditations* with language that was familiar to Aristotelian scholastics. He starts in a position that Aristotelians would agree with by stating the epistemological value of external senses, but then gradually calls them into doubt.⁵ After this, he proceeds to expand his prejudice destructing power of doubt, thereby still holding hands with the Aristotelians (e.g. by using Aristotle’s wax metaphor⁶ in the second *Meditation*) and argues that most certain knowledge arises from the mind itself, without the use of the senses:

What about the things, then, that I attributed to the soul? To be nourished or to walk? Since I no longer have a body, these are only fictions. To sense? But even this cannot be done

⁵ AT vii, 17

⁶ The wax metaphor was a known metaphor also used by Avicenna -who was influenced by Aristotle- to explain the dimensionality of the body.

without a body and I seemed to sense many things while dreaming that I later realized I had not sensed. To think? That's it. It is thought. This alone cannot be detached from me. I am, I exist; that is certain.⁷

Now that the Cogito is born in the second *Meditation*, Descartes explores what this "I" exactly is, relates it to the existence of God (*Meditation III*)⁸ and identifies both intellect and will within the mind (*Meditation IV*).⁹ Descartes thus starts from an Aristotelian point of view, doubts the certainty of knowledge based on the senses, identifies the mind as a non-extended thinking essence, *res cogitans*, which can be known most certainly. He then extrapolates this to the existence of a body, which is an extended non-thinking thing, *res extensa*. By doing this, he effectively and gradually denies that a soul has vegetative, sensitive and rational parts and he ascribes the vegetative and sensitive functions to the machine-like body and not to the soul as Aristotle did. He thus naturalizes or materializes the unnecessarily metaphysical Aristotelian functions of the soul by ascribing them to the physiological body. He distills the rational soul, the Cogito, and concentrates on this 'thinking thing' as the only soul, which he preferably calls mind:

the first men did not perhaps distinguish between, on one hand, that principle in us by which we are nourished, grow, and perform without any thought all the other functions we have in common with the brutes, and on the other hand, that principle by which we think. They applied to both the single term "soul." Then, noticing that thought is different from nutrition, they called that which thinks "mind," and believed that it is the principal part of the soul. I, however, noticing that the principle by which we are nourished is entirely different from the principle by which we think, have said that the term "soul" is ambiguous when it is used for both. And in order to understand it as the first act or principal form of

⁷ AT vii, 25

⁸ AT vii, 52

⁹ AT vii, 63

man, it must only be understood as the principle by which we think. To this I have as much as possible applied the term “mind,” in order to avoid ambiguity. For I do not regard the mind as a part of the soul, but as the whole soul, which thinks.¹⁰

This Cartesian human mind, the *Cogito*, has some crucial qualities. First, it has two main kinds of thoughts: the will and the passions. I will extensively elaborate on the passions in the next section. The will, unlike the passions, depends on the mind alone and, according to Descartes, it intends either towards non-material objects such as “when we will to love God” or towards material objects such as our body “because we will to go for a stroll, our legs move, and we walk”.¹¹ For Descartes, as argued in *Meditation IV*, the will is an instrument that contains such power that “it is principally because of this faculty that I understand myself as being in some sense the image and likeness of God”.¹² This will has the ability to make free choices, which at the same time has the potential to become a source of error in judgements if it reaches out for things outside the faculty of understanding and intellect and uses the freedom of choice in incorrect ways. As we will see later, Descartes also puts the will in a less metaphysical and more neurophysiological perspective in relation to the passions, which also has important implications for his moral system. The second quality of the human mind is that it receives feedback from the bodily machine and becomes aware, conscious and self-conscious:

I understand by the term ‘thought’ everything that is in us in such a way that we are immediately conscious of it. Thus, all operations of the will, intellect, imagination and the senses are thoughts”¹³

¹⁰ AT vii, 356

¹¹ Art. 18, AT xi, 343

¹² AT vii, 55

¹³ AT vii, 160

When, in other words, the machine initiates an automatic movement (e.g. running after seeing a bear), animal spirits flow in such a way that they move the pineal gland in a certain direction (as I will illustrate in more detail in Chapter 2), which makes the mind aware of the fact that the machine is running away from a killer animal. The human mind becomes self-conscious and consequently wills to continue this action that is beneficial for the machine (or wills to be courageous and turns around to confront the bear). Before I further elaborate on the Cartesian notion of self-consciousness, I will first discuss the passions of the body, the neurophysiological processes behind them and their relationship with the mind in the next section.

1.2 Passions of the Body

my purpose has not been to explain the Passions as an orator, or even as a moral philosopher, but only as a physicist.¹⁴

- René Descartes

Human appetites were often ascribed to the lower human self in a tradition that originates in Plato¹⁵, followed by Aristotle, the Stoics and scholastics such as Thomas Aquinas. This latter tradition held that the soul had different hierarchical parts, in which the rational appetite or the will had to control the two sensitive “irascible” and “concupiscible” appetites.¹⁶ The passions were classically ascribed to this sensitive appetite, which was closely related to the body and pulled the rational soul “downwards” from the heavens to earth, to whatever is bad or amoral. This scholastic perspective on the passions influenced many seventeenth century thinkers and although Descartes was one of them, he explicitly announced his intention to break with this tradition by explaining the passions “only as a physicist”.¹⁷ Perhaps the most important disagreement with the scholastic tradition was that for Descartes the soul could not have any parts; it was only one:

¹⁴ AT xi, 326

¹⁵ Lorenz, Hendrik, "Ancient Theories of Soul", *The Stanford Encyclopedia of Philosophy* (Summer 2009 Edition), Edward N. Zalta (ed.), URL = <<https://plato.stanford.edu/archives/sum2009/entries/ancient-soul/>>.

This tradition can even be found in pre-Socratic era in both philosophical systems (for example with Pythagoras and his effort to tame his appetite with a vegetarian diet) and theological systems (Moses' Laws; fasting in Judaism and later also in Christianity and Islam).

¹⁶ Kambouchner, Denis. 2019. 'Descartes and the Passion' in *The Oxford Handbook of Descartes and Cartesianism*. Edited by Nadler, Steven M, Tad M Schmaltz, and Delphine Kolesnik-Antoine. Oxford: Oxford University Press. Comparable with the Tripartite soul of Plato, see Chariot Allegory in previous chapter.

¹⁷ AT xi, 326

The error which has been committed in having it play different characters, usually opposed to one another, arises only from the fact that its functions have not been rightly distinguished from those of the body, to which alone must be attributed everything to be found in us that is opposed to our reason¹⁸

Since Descartes had naturized the vegetative and sensitive Aristotelean soul, he now had to move the passions from the soul's sensitive appetite to the body, which was exactly the project of his *Passions of the Soul*.

Descartes starts first by identifying two kinds of thoughts; the will and passions. The former come in two kinds; the will towards non-material objects, such as love for God, and the will to perform an action with our body. For Descartes, the term passion "can be applied in general to all the kinds of perception or knowledge to be found within us"¹⁹ as well as to "passive responses in the mind to a bodily action"²⁰, thus "caused mainly by external senses."²¹ These passions or perceptions are either caused by the soul, which are perceptions of our own imagination or will,²² or by the body. Perceptions caused by the body are mainly enabled by nerves and I will elaborate on the neurophysiological processes behind these passions extensively in the next chapter. Descartes identifies three kinds of these passions: "those we refer to external objects that act upon our senses; those we refer to our body or some of its parts; and, finally, those we refer to our souls."²³ The first passions are the five exterior senses; sight, hearing, smell, taste and touch. The second are natural appetites such as hunger, thirst and pain. The last type of passions, those we refer to our soul, are primitive passions or

¹⁸ Art. 47, AT xi, 364

¹⁹ Art. 17, AT xi, 342

²⁰ AT 11:328, a. 2

²¹ Art. 51, AT xi, 371

²² I will argue in the last section that this is one of Descartes most original ideas, which is a proto self-consciousness notion that precedes some modern anthropological concepts such as Helmutt Plessner's "excentricism".

²³ Art. 22, AT xi, 337

emotions²⁴ (wonder, love, hate, desire, joy and sadness)²⁵, which Descartes intended to explain mainly in his *Passions of the Soul*.²⁶

How do passions arise in the Cartesian neurophysiological system? First, I will describe the Cartesian neurophysiology behind two kinds of passions: “those we refer to external objects that act upon our senses; those we refer to our body or some of its parts”,²⁷ or simply sensations, mainly based on the *Treatise on Man*. Then I will turn towards his more detailed work on the passions that “we refer to our souls”,²⁸ which will be simply referred to as ‘emotions’ hereafter, as Descartes preferred, especially in relation to the pineal gland, as elaborated in the *Passions of the Soul*.

In the *Treatise*, Descartes aims to explain how sensations arise in his machine. Crucial entities that makes this machine function properly are the animal spirits; “a certain very fine wind, or rather a very lively and pure flame”.²⁹ These spirits are constituted by the fines part of the blood, which is pumped from the heart to the brain. In the brain, these spirits “come together again around a certain little gland, situated near the middle of the substance of the brain, right at the entrance to its cavities.”³⁰ Descartes describes in more detail how this gland operates, and, for the moment, suffices with this explanation, being more concerned with how the machine reacts to external senses. When the animal spirits enter the brain and the gland through its pores, they flow into tiny nerve tubules and eventually from the brain into muscles, where they cause the muscle to move a limb. Next to the motor functions, sensory perceptions are also explained. In vision, for example, light reflects from an external object onto the retina,

²⁴ As preferably called by Descartes, see Art. 28, AT xi, 343

²⁵ Art. 69, AT xi, 380

²⁶ Art. 25, AT xi, 340. Indeed, part 2 and 3 of the passions are mainly dedicated to explaining them

²⁷ Art. 22, AT xi, 337

²⁸ idem

²⁹ AT xi, 100

³⁰ idem

exciting tiny optic nerve fibers that are arranged in a particular way and consequently form a particular arrangement (i.e., the image of the object) on the surface of the brain. When spirits flow more often in a particular way in the gland, these pores open more widely, which constitutes memory. All of this can thus happen in an unensouled Cartesian machine. As mentioned in Chapter 1.1, this explanation has a major implication, since there is no need for a metaphysical Aristotelian vegetative or sensitive soul to explain sensory perceptions, growth, movement, because these functions “follow from the mere arrangement of the machine’s organs every bit as naturally as the movements of a clock or other automaton follow from the arrangement of its counter-weights and wheels”.³¹

In the *Passions of the Soul*, Descartes elaborates further on how his machine and especially how the physiological processes behind emotions function. Emotions are traditionally often located in the heart, but according to Descartes this is a misconception that arises because we *seem* to feel a certain emotion in the heart. Descartes anatomically debunks this theory by pointing to “a little nerve that descends to it [the heart] from the brain”³², which is the Tenth or Vagus nerve. According to Descartes, emotions do not arise from the heart, but from the movement of the pineal gland, which is “a certain part of the body in which it [the soul] exercises its functions more particularly than all in the rest”, “situated in the middle of the substance of the brain”.³³ As Descartes illustrated; when we see an animal, our body automatically flees from it due to previous experiences:

for in some people past experience produces a disposition in the brain such that the spirits that carry the reflection of the image thus formed on the gland flow partly into the nerves the function of which is to turn our backs and move the legs in order to flee and partly into

³¹ AT xi, 108; see also AT vi, 50

³² Art. 33, AT xi, 353

³³ Art. 31, AT xi, 352

the nerves that expand or contract the orifices of the heart, or else agitate the other parts of the body from which the blood is conveyed to the heart, in such a way that the blood is rarefied in an unusual fashion.³⁴

As a consequence, the rarefaction of blood produces fine particles, animal spirits, which flow in such a way that causes certain movements in the pineal gland, thereby arousing the emotion of fear. Different flows of animal spirits³⁵ cause different movements of the pineal gland, which consequently result in different emotions. In contrast to the previously described neurophysiological processes behind sensations, this example illustrates how certain emotions arise, that are necessary to preserve the wellbeing and safety of the body by pursuing what the machinal body automatically initiated. But the reverse physiological impact on the pineal gland is also possible. When the mind wills (volition) to move the body, it “causes the little gland, to which it is closely joined, to move in whatever manner is necessary to produce the effect connected with this volition”³⁶ and thus “causes the gland to drive the spirits to the muscles that produce the desired effect”.³⁷ This is an example of a voluntary movement. There are also involuntary movements, such as a reflex to flee from an animal as previously described or enlarging the iris to focus on a very near object.³⁸ These movements occur without interference from the soul, and form a pure unensouled, mechanical, involuntary movement. In fact, Descartes notices, even if the soul wills to enlarge the iris, it can never do so. Now that we have discussed the neurophysiological processes of the passions, we can proceed to the moral implications of these passions, since according to Descartes there should be a particular order in the philosophical tree of which:

³⁴ Art. 36, AT xi, 356

³⁵ Part 2 of the *Passions* is mainly devoted to explaining how spirits flow in different emotions, which I will not mention in detail in this essay for every specific emotion.

³⁶ Art. 41, AT xi, 359

³⁷ Art. 43, AT xi, 361

³⁸ Art. 44, AT xi, 362

The roots are metaphysics, the trunk is physics, and the branches emerging from the trunk are all the other sciences, which may be reduced to three principal ones, namely medicine, mechanics and morals.³⁹

I will only briefly elaborate on Cartesian morality, since Descartes himself announced that his main project was to explain the passions as a physicist, instead of discussing their moral implications. Although Descartes broke with the tradition with a physical perspective on the passions, the scholastic remnants are still there. Cartesian reason, too, tries to overcome “the lesser passions”.⁴⁰ However, physiology plays a key role in the explanation of this mechanism; when blood is excited more strongly, the will has to put more effort into overcoming this excitation “until after the excitation of the blood and the spirits has passed”⁴¹. However, “the supposed conflicts between the lower, so-called ‘sensitive’, part of the soul, and the higher rational part, or between the natural appetites and the will” – i.e., the conflict in the soul as argued by Plato and the Aristotelean schools – is a mistake, as partly mentioned in the previous section.⁴² The only conflict is a physiological conflict in the pineal gland, which is “impelled in one direction by the soul [its will] and in another by the animal spirits, which as I said above, are bodies pure and simple. It therefore often happens that the two impulsions are opposed, and that the stronger one nullifies the effect of the other.”⁴³ For Descartes then, the passions are motivational stimuli that by nature are good⁴⁴ and beneficial to our mechanical body:

³⁹ AT ix, 14

⁴⁰ Art. 46, AT xi, 363

⁴¹ Art. 47, AT xi, 364

⁴² idem

⁴³ idem

⁴⁴ Art. 211, AT xi, 486

The function of all the passions consists solely in this, that they dispose our soul to want the things which nature deems useful for us, and to persist in this volition; and the same agitation of the spirits which normally causes the passions also disposes the body to make movements which help to attain these things.⁴⁵

A weak soul in this sense doesn't use its "firm and definite judgments concerning the difference between good and evil", thereby "allows itself to be continually swept away by the passions of the moment".⁴⁶ Moral progression for Descartes should be endeavored, not by nullifying or silencing the passions, but through an effort to "train them and guide them properly"⁴⁷ and "to avoid only their misuse or their excess"⁴⁸ for the benefit of the human body:

the chief use of wisdom lies in its teaching us to be masters of our passions and to control them with such skill that the evils which they cause are quite bearable, and even become a source of joy.⁴⁹

Since the pineal gland plays such a key role in neurophysiological processes behind these passions and their potential source of joy, I will discuss in the next chapter in more detail the history of this gland and its significance from a neurophysiological perspective, rather than a metaphysical one, for Descartes as a scientist.

⁴⁵ Art. 52, AT xi, 372

⁴⁶ Art. 48, AT xi, 367

⁴⁷ Art. 50, AT xi, 369

⁴⁸ Art. 211, AT xi, 486

⁴⁹ Art. 212, AT xi, 488

The Throne

There's a little gland in the brain where the soul does its work more particularly than elsewhere in the body.⁵⁰

- René Descartes

2.1 The Pineal Gland

Galen of Pergamon (130-210), physician and philosopher influenced by both Plato and Aristotle, attempted anatomically to localize the tripartite soul – reason, appetite and spirit, see Chapter 1.1 – in the body. Reason had to be located in the brain, since it was concerned with decision-making, memory, and knowledge. The fire of spirit was located in the heating, pumping and passionate heart and was involved in supporting life itself, as well as temperament or anger. Appetite was located in the liver, concerned with satisfying needs, pleasure and with the fluid of life: blood. The best state, according to Galen, is when the strengths of these three parts are in balance, with reason in charge over the strong spirit and weak appetite, a well-known Platonic interpretation of the soul.

To support his doctrine on the tripartite localization of the soul within the body, Galen had to identify anatomical pathways connecting these organs with each other. Since the soul was a single thing with three parts, these parts had to be connected and Galen was convinced that he could indicate the connections through dissections. Galen's dissection studies indeed found three structures connecting the brain with the heart: nerves, arteries and veins. As a physician and anatomist, he continued these dissection studies in order to localize the rational soul within

⁵⁰ Art. 31, AT xi, 352

the brain in more detail. Galen argued that the ventricles were filled with pneuma, a fine wind, which was the soul's substance. He argued that the cone shaped gland (kônos), the pineal gland, was unsuited to function as the seat of the soul, because it was localized outside the brain.⁵¹ There was another worm-like organ, the vermis cerebelli superior⁵², which connects the two cerebellar hemispheres, and was thought to be better suited to regulate the flow of psychic pneuma. Spirits could enter via this worm-like structure and flow through the brain's ventricles. Galen influenced many anatomists and philosophers on the localization of the mind within the brain, including Descartes. It seems that Descartes' neuro-anatomical knowledge was not very accurate, since some of his claims on the structure of the pineal gland had already been proven false by Galen (e.g., the error that the pineal gland was located in-between the ventricles). In addition, his Galenic claim that the ventricles were filled with air-like spirit had already been disproven a century earlier by Massa in 1536, who showed that it was actually filled with fluid (i.e. cerebrospinal fluid).⁵³

Regardless, Descartes believed that the soul had to interact with the pineal gland, because unlike other parts of the brain, it was solid, undivided and in addition, because "it is small, light and easily movable"⁵⁴ and because of "the fact that sense-organs come in pairs" and need to be

⁵¹ Apparently, there was already some interest in the pineal gland in Galen's era, however, it is unknown to who Galen responded and dismissed this structure as a possibility to be the seat of the soul.

⁵² Although originally Galen named this structure "wormlike epiphysis", today "epiphysis" is used synonymously with the pineal gland. See Larry W. Swanson *Terminology: A Lexicon of Classical Origins and Historical Foundations*. pp 113

⁵³ Lokhorst, Gert-Jan, "Descartes and the Pineal Gland", *The Stanford Encyclopedia of Philosophy* (Winter 2018 Edition), Edward N. Zalta (ed.), URL = <<https://plato.stanford.edu/archives/win2018/entries/pineal-gland/>>.

⁵⁴ AT iii, 20

“brought together in a single impression before reaching the soul”.⁵⁵ Since Descartes could not identify any other structure in the body, this non-double gland had to be the principle functional center of the mind. Descartes considered other candidates such as the pituitary gland (hypophyses) and the Galenic vermis cerebelli superior to be unsuitable, because they were outside the brain and divisible respectively. I would wish to emphasize, however, that Descartes did not point to the pineal gland as the place where the soul could be *located*. Descartes was well aware that it was contradictory to appoint the non-material mind to a material anatomical structure, as mentioned in article 30 of the *Passions*:

The soul is united to all the body’s parts together.

For a perfect grasp of all this we need to recognize that the soul is really joined to the whole body and can’t properly be said to exist in any one part of the body rather than in others. Why? Because the body is a unity that is in a way indivisible, its organs are so arranged that the removal of any one of them makes the whole body defective. And because the nature of the soul won’t let it have any relation to extension, or to the dimensions or other properties of the matter the body is made of; all it can be related to is the whole assemblage of the body’s organs.⁵⁶

Rather than “the seat of the ghost”, the pineal gland for Descartes was the most suited structure in the body where the soul could “directly exercise its functions” by unifying all external sense-perceptions.⁵⁷ The pineal gland was thus a structure in which the mind was not located, but where it exercised its functions in particular ways. I believe that the misconception arises from the French word that Descartes uses: “Le Siège”, or “Seat/Chair”, which indeed has a strong

⁵⁵ Art. 32, AT xi, 353

⁵⁶ Art. 30, AT xi, 351

⁵⁷ Art. 32, AT xi, 353

spatial implication. But besides this, Descartes seems to be very cautious not to ascribe any dimensionality to the Cogito. He describes the gland rather as the functional center of the mind, more than a spatial center. It regulates the flow of (not Galenic pneuma, but) animal spirit, which for Descartes was a fine substance originating in the blood, as explained in the previous sections of the *Passions*.⁵⁸ Descartes indeed explicitly mentions *that* the mind has the power that when “by the mere fact that it wants something, it causes the little gland, to which it is closely joined, to move in whatever manner is necessary to produce the effect connected with this volition.”⁵⁹ The more important question then, is not were Descartes thought the soul could be *located*, but *how* the mind, as a non-material, non-dimensional substance could causally interact, join or unite with the material, dimensional pineal gland and exercise its function. Indeed, Descartes promises in his *Treatise* first to describe the machine, then the soul and finally how this machine interacts with the soul:

These men will be composed, as we are, of a soul and a body. First, I must describe the body on its own; then the soul, again on its own; and finally, I must show how these two natures would have to be joined and united in order to constitute men who resemble us.⁶⁰

We have seen in this chapter and the previous one on the *Passions*, that Descartes does indeed give an original and detailed description on the machinal body and its neurophysiology, as he promised. We have also seen his description of the soul based on the *Meditations* in the first chapter. Descartes started out with the Aristotelian metaphysical notion of the soul, gradually ascribed the functions of the vegetative and sensitive soul to the machinal body and thereby distilled the non-material, thinking Cogito. Yet, although Descartes does describe the body and

⁵⁸ Art. 31-35, AT xi, 351-356

⁵⁹ Art. 42, AT xi, 360

⁶⁰ AT xi, 119

the soul on their own, he effectively never manages to fulfill his last promise in the *Treatise* in any satisfactory manner, and the attempts that he did undertake received critique from both his contemporaries and thinkers who came after him. In the next sections, I will discuss both the critiques that Descartes received on his mind-body dualism and how this critique eclipsed Descartes' main interest in and project regarding the Cogito. In the last chapter, I will return to the Cogito and argue that with it, Descartes formulated the notion of proto self-consciousness.

2.2 Mind-Body Dualism

... how can the human soul, which is only a thinking substance, determine the movement of the animal spirits in order to perform a voluntary action? ⁶¹

- Princess Elizabeth

With this question, Princess Elisabeth (1618-1680) started her correspondence with Descartes in May 6, 1643 on the issue of mind-body dualism. Elizabeth was born in Heidelberg in 1618 as the eldest daughter of Frederick V (King of Bohemia) and Elizabeth Stuart (the daughter of the King of Scotland).⁶² She was well-educated in different fields such as mathematics, politics and natural sciences. One year after her first correspondence with Descartes, she would be complemented in the Letter of Dedication of the *Principles of Philosophy* by her correspondent as follows:

The outstanding and incomparable sharpness of your intelligence is obvious from the penetrating examination you have made of all the secrets of these sciences, and from the fact that you have acquired an exact knowledge of them in so short a time. I have even greater evidence of your powers – and this is special to myself – in the fact that you are the only person I have so far found who was completely understood all my previously published works.⁶³

⁶¹ AT iii, 661

⁶² Shapiro, Lisa. 2019. 'Princess Elisabeth of Bohemia as a Cartesian' in *The Oxford Handbook of Descartes and Cartesianism*. Edited by Nadler, Steven M, Tad M Schmaltz, and Delphine Kolesnik-Antoine. Oxford: Oxford University Press.

⁶³ AT viii, 3

Although Elizabeth was a philosophical ally of Descartes and despite the empathy for his ideas, Elizabeth was a critical reader of both his published works and his answers to the questions that she posed during correspondence with Descartes. Elizabeth posed two critical questions at the start of the correspondence. First, she asked for a more specific description of the Cartesian soul than the one provided in the *Meditations*, and, in relation to this, she asked how the Cartesian immaterial soul could interact with the material body.

Descartes first attempts to answer these questions in a letter of 21 May 1643, in which he describes the characteristics of the soul as follows: “one is that it thinks and the other is that, since it is united with the body, it can act and be acted on in conjunction with the body”.⁶⁴ Before answering the second question, Descartes emphasizes that his main aim was not to unite the body and the soul, but on the contrary, “to prove the distinction between the soul and the body”.⁶⁵ As mentioned earlier in the first chapter, what he really meant was that he tried to prove the distinction between the Aristotelean, scholastic notion of the soul, from the physical body. Which, as we will see a bit later in this section, was a feat Descartes successfully accomplished, according to Elizabeth.

Descartes first attempts to explain mind-body interaction by introducing three notions on “which we construct all our other knowledge”.⁶⁶ First, the notion of extension, which includes shape, movement and which apply to everything physical and is specifically for the material body. Next, the notion of thought for the soul, which includes perceptions of the understanding and inclinations of the will. He finally introduces the notion of ‘union’, which is applied to the mutual cooperation of body and soul: “of the soul’s power to move the body and the body’s power to act on the soul by causing its sensations and passions”.⁶⁷ According to Descartes,

⁶⁴ AT iii, 661

⁶⁵ Ibid.

⁶⁶ Ibid.

⁶⁷ Ibid.

errors arise when these notions are mixed up. In this attempt, he gives the analogy of heaviness as a quality that we imagine to be united with material objects; in the same way, thought is united to our body. However, as Descartes realizes, it is unclear to Elizabeth how to acquire knowledge on or distinguish these three notions. To complicate matters even further, the analogy of heaviness to explain that the scholastic immaterial quality is not distinct from a material object, confuses Elizabeth even further and backfires against Descartes' own theory, questioning the necessity of an immaterial cause to move the body in the first place, as confronted by Elizabeth. In essence, Descartes fails to give a clear answer to Elizabeth's question on how the mind interacts with the body and admits in his letter of 28 June 1643 that "the human mind is incapable of conceiving very distinctly and simultaneously, both the distinction and union of body and soul", because such a concept is self-contradictory.⁶⁸ He basically says that we, as human beings, are not able to know or understand how the interaction between the mind and the body causally occurs. As an escape from his two failed attempts, Descartes advises Elizabeth not to delve too deeply into this kind of detailed philosophical matters anyway. Elizabeth excuses Descartes for his unconvincing attempts by stating that his philosophy "at the very least, defeats the scholastic contradiction that the whole soul is in the whole body and in each part of the body" and saved her from skepticism.⁶⁹

Although Elizabeth, as a Cartesian, did not push Descartes any further on his Achilles' heel, this issue did trigger a debate among late seventeenth and early eighteenth-century philosophers. I will give an overview of the debate on how an immaterial soul could causally interact with a material body by illustrating two types of objections.⁷⁰ First there were those

Some Descartes scholars have used the term Cartesian trichism (in contrast to dualism) due to these three notions of Descartes. It falls outside the scope of this essay to elaborate further on this interpretation.

⁶⁸ AT iii, 693

⁶⁹ AT iv, 2

⁷⁰ I will offer only a brief, general discussion and a nonexhaustive overview of the late seventeenth and early eighteenth-century mind-body debate. A detailed discussion would exceed my abilities, nor is it the aim of this

who argued that such an interaction could only be possible with either the direct intervention or pre-programming of God, respectively by Malebranche and Leibniz, and second those who argued that such interaction could not be possible at all, because they objected to the idea of two distinct substances, arguing this either in a metaphysical (Spinoza) or in a materialist sense (La Mettrie). Nicolas Malebranche (1638-1715) was a French priest influenced by Cartesian philosophy. For Malebranche, only God had power for causal influences and whatever he created, both bodies and minds, only led to occasions for divine activity; hence “occasionalism”. In Cartesian terms, neither are perceptions in the body able to cause changes in the mind, nor is the mind able causally to interact with the pineal gland and move it in certain directions in order to initiate voluntary movement in the body. It is God who intervenes and causes changes in the mind initiated by bodily perceptions and it is God, again, who creates voluntary movements in the body that are initiated by the mind’s will. Gottfried Leibniz (1646-1716) agreed with Malebranche that God’s intervention was needed in this causal path and indeed that God was the only causal agent. He had an alternative to occasionalism, in which God pre-programmed all substances, both the mind and body, in advance. For Leibniz therefore, the mind is not able causally to effect the body and vice versa; all substances (monads) in the universe are in harmony with another due to God’s pre-programming, and therefore it only appears to us as if there was a causal reaction between mind and body (pre-established harmony).

Perhaps the philosophically most influential objection came from Baruch Spinoza (1632-1677), who as a young philosopher was attracted by Cartesian philosophy. Later however, Spinoza gradually developed his own theory and eventually fundamentally rejected Cartesian

essay. I will highlight the theories of some philosophers and relate these to Cartesianism, without delving too deep in the philosophy of causation.

mind-body dualism.⁷¹ For Spinoza, there is and can be only one substance, which is self-caused, infinite, eternal, and which he identified with God; “By substance I understand what is in itself and is conceived through itself, i.e., that whose concept does not require the concept of another thing, from which it must be formed”.⁷² The Cartesian impact on Spinoza can be seen even from the definition that he gave as reaction to Descartes, who defined substance as “a thing which exists in such a way as to depend on no other thing for its existence”.⁷³ Spinoza effectively radicalized the Cartesian definition of substance and replies to the Cartesians by saying that if such a Cartesian definition of substance is accepted, this should be done even more radically, necessarily leading to the conclusion that there can only be one substance. He thus objected to Cartesian mind-body dualism by using Cartesian philosophy itself, resulting in what could be identified as a ‘substance monism’. In this view, the immaterial mind and material body are not two distinct substances, but two attributes or modes, namely thought as mind and extension as body, of a single substance, or God: “A mode of extension and the idea of that mode are one and the same things, but expressed in two ways.”⁷⁴ In other words, for Spinoza, the word causal “interaction” between the mind and body is not even applicable to the problem, since there are no two separated entities that need interaction in the first place.

Sixty years after Spinoza, Julien Offray de La Mettrie (1709-1751) objected to mind-body dualism not with a metaphysical critique as that of Spinoza, but with a materialist one. La Mettrie radicalized the human body as a Cartesian machine, while rejecting the existence of a human soul, as expressed in his *L’homme Machine*.⁷⁵ Indeed, La Mettrie, as a physician-

⁷¹ Nadler, Steven. 2019. ‘Spinoza, Descartes, and the “Stupid Cartesians”’ in *The Oxford Handbook of Descartes and Cartesianism*. Edited by Nadler, Steven M, Tad M Schmaltz, and Delphine Kolesnik-Antoine. Oxford: Oxford University Press.

⁷² Ethics, Part I, proposition 3

⁷³ AT viii, 24

⁷⁴ Ethics II, proposition 7

⁷⁵ de La Mettrie, Julien. 2003. *Man a Machine*. Cambridge: Cambridge University Press.

philosopher, attempted to resolve the mind-body problem by objecting to the existence of the human soul. For him, there was no immaterial substance by which a human being could causally interact with the world; there was no need for such an entity. According to La Mettrie, the material body with its anatomy and physiology was sufficient in itself.

Thus, the question how the immaterial mind is able causally to interact with the material body was first discussed by Princess Elizabeth and Descartes himself. Descartes failed to give a clear answer to this problem, simply because he admitted that the human mind in its nature is incapable to grasp this concept. More importantly, Descartes already emphasized explicitly that his main aim was to prove the distinction between the Aristotelian soul and the body, rather than to prove mind-body union. Nevertheless, his main project was eclipsed by the mind-body dualism debate that started among late seventeenth and early eighteenth-century philosophers, including Malebranche, Leibniz, Spinoza and La Mettrie.

In what follows, I will shift the focus of this essay back to Descartes' main project (as discussed in the previous sections on the basis of the *Meditations* and *Passions*), which focused on the distinction between the machinal human body with all its neurophysiology and the immaterial human mind, or *Cogito*. The reason for doing so, is to show how, by leaving aside the metaphysical discussion, Descartes' original notion of the Cogito may explain the human mind as proto self-consciousness and how this idea is still relevant to modern neuroscientific and philosophical concepts of consciousness.

3. Cartesian Consciousness

3.1 The Mind Redefined

Thought. I use this term to include everything that is within us in such a way that we are immediately aware of it.⁷⁶

- René Descartes

As we have seen in previous chapters, Descartes' main project was to prove the distinction between the material human body and the immaterial thinking human mind. He did this by defining the material body as an unensouled, living machine with all its physiological processes that influenced and could be influenced by the human mind. The human mind for Descartes in turn, is essentially a distinct, self-conscious, immaterial type of 'thought' with a will and an intellect. Descartes hereby initiated a modern view on human psychology (as against the metaphysical, Aristotelean notion of mind and body) that is underappreciated due to the mind-body discussion started in the late-seventeenth century – and which continues till date. I will further elaborate on Descartes' notion of the human mind in this chapter, which Descartes himself defined in terms of consciousness. The Cartesian human mind is not solely an intellectual entity; it has sense perception as a result of the union with the body. This perception has three levels; first, perceptions that arise in the mechanical human body through interaction with the external world, and two further levels that arise in the mind itself.

Both the information that enters the body from the external world (via the five senses) and the information within the body itself (such as emotions or hunger and thirst) is immediately perceived in the mind itself and interpreted accordingly:

⁷⁶ AT vii, 160

To the first level pertains only that by which the corporeal organ is immediately affected by external objects. And this can only be the motion of the particles of the organ in question and the change in configuration and position resulting from that motion. The second level contain everything that results immediately in the mind due to the fact that it is united to the corporeal organ so affected, and such are the perceptions of pain, pleasure, thirst, hunger, colors, sound, flavor, smell, heat, cold, and the like, which result from the union and, as it were, intermingling of mind and body, as I said in *Meditation VI*. The third level comprises all those judgments about external objects which we have been used to making since our earliest childhood on the occasion of the motions of the corporeal organ.⁷⁷

After this paragraph in the *Sixth Reply*, Descartes argues that this third level of perception, the interpretation of the external world based on perception, depends on the mind's intellect. The eye sees a stick (following Descartes' own example); its color, size, shape and its location in the external world. The mind uses its intellect and previously lived experience in order to interpret non-value laden data of a stick, entering the brain via the retina. The mind makes a judgement about this stick and its relative distance to the body; the meaning of its size and color; whether it might benefit or harm the body, etc. There is a cooperation, a unification between mind and body in the second and third levels of sense perception. It should be emphasized that for Descartes, this is required an intermingling of mind and body (as an analogy, since Descartes was aware that material and immaterial substances could not 'mix'), rather than a relation between them as in the Aristotelian image of sailor to a ship or, in Rylean terms, a ghost in a machine.⁷⁸ Although grasping the nature of the notion of union is difficult, as Descartes admitted to Elizabeth, the result of this union in terms of sense perception is

⁷⁷ AT vii, 437

⁷⁸ Ryle, Gilbert. 1949. *The Concept of Mind*. London: Penguin Books.

intuitively clear. Sense perceptions (level two and three) can only result from a mind-body union and cannot be pure thoughts of the human mind alone:

we perceive that sensations of pain and all other sensations are not pure thoughts of the mind distinct from the body, but confused perceptions of the mind really united to the body.⁷⁹

Sense perception is thus a mixed sub-class of thought for the human mind,⁸⁰ such that it can make judgments about the body and the external world, as a union with the body itself. The psychological implication of such a notion needs to be carefully considered: the human mind becomes not only conscious of its own thought, its body and the relation of its body to the external world; it necessarily needs the body with its brain and all its nerves, and contact with the external world in order for such consciousness to arise. Descartes essentially proposes the neuro-anatomical correlates of self-consciousness. With the body, the human mind becomes aware of the passions proper or emotions such as love, hatred and desire. It needs the body to experience internal sensations such as hunger and thirst and in order to have external sensations. The mind may respond to internal and external senses through its will by moving the body, or by affirming or denying judgements and passions. This is not a purely philosophical, epistemological exercise of the human mind trying to know and discover the external world on its own, but primarily a natural way to maintain the health of the body and prevent it from danger. Before any philosophical expeditions into the discovery of metaphysical concepts about the reality of the external world or of God, the human mind necessarily needs to use its intellect in order to survive not just in, but in cooperation with the

⁷⁹ AT iii, 493

⁸⁰ Rozemond, Marleen. 2006. 'The Nature of the Mind' in *The Blackwell Guide to Descartes' Meditations*. Edited by Gaukroger, Stephen. Wiley-Blackwell.

material body. All the processes, that is, comprising level two and three level type of perceptions via the external senses (judgements about a stick) together with internal senses, as well as the interpretations of all these perceptions, the responses of the mind itself through the intellect and will, together constitute the realm of Cartesian self-consciousness.

It should also be mentioned that the mind and its volition is not necessarily involved in every process to protect the body from danger.⁸¹ For Descartes, the human body as a machine has its own automated build-in systems to protect its own body with reflexes, which do not need any mental involvement:

When people take a fall, and stick out their hands so as to protect their head, it is not reason that instructs them to do this; it is simply that the sight of the impending fall reaches the brain and sends the animal spirits into the nerves in the manner necessary to produce this movement even without any mental volition, just as it would be produced in a machine.⁸²

Some of these automated reflexes, such as sticking out a hand when falling, would be noticed and only afterwards interpreted and judged upon by the mind. Other reflexes, such as protecting the cornea by blinking, breathing or seeing subliminal advertisements, never truly reaches the level 3 type of sense perception within the human mind at all; in the case of a reflex this is obvious, but it is also true that they do not have to reach this afterwards (in contrast to the example above). From a Cartesian perspective, these reflexes or involuntary movements would not even have to reach consciousness and might be limited to the realm of un- or at least subconscious states.

⁸¹ Hatfield, Gary. 2019. 'Mind and Psychology in Descartes' in *The Oxford Handbook of Descartes and Cartesianism*. Edited by Nadler, Steven M, Tad M Schmaltz, and Delphine Kolesnik-Antoine. Oxford: Oxford University Press.

⁸² AT vii, 230

The novelty of the Cartesian idea of consciousness is not necessarily that a notion of self-consciousness is recognized and formulated (Descartes may not necessarily be the first one to do so). The novelty is in the fact that next to the human mind, the material body (with its brain, nerves, pineal gland, retina, blood etc.) has an essential role to play, which Descartes adapted as a key function in the notion of his understanding of consciousness.

Descartes thus, as one of the first, already proposed the neuro-anatomical correlates of self-consciousness, and may therefore be seen as the predecessor of modern neuroscientific and philosophical concepts of consciousness. Although we have traced the influences of Cartesian philosophy in the previous chapter up to La Mettrie in early eighteenth century, the mind-body debate would continue to influence philosophical theories of consciousness and human anthropology throughout the nineteenth century and up to the present day.⁸³ One such notion of consciousness comes from the twentieth-century philosopher Helmut Plessner. Plessner, who was influenced by the phenomenologist of consciousness Edmund Husserl, described three ‘stages’ of consciousness. Plants with an open positionality, who live; animals with a centric positionality who not only live but also experience life itself; and humans with an excentric positionality, who both live, experience life and also experience that they experience.⁸⁴ Humans, in this sense, do not only have consciousness, but they are aware that they are conscious, i.e. they are self-conscious. As a side note, it is from this context that Descartes describes animals as unensouled machines. In contrast to a superficial interpretation that animals do not have emotions or any such thing, for Descartes, animals do not have a self-reflective capacity on their own emotions and existence, and therefore lack “thought” as a form

⁸³ These theories vary from a more philosophical perspective to more scientific one such as the Integrative Information Theory. I will briefly elaborate on one former theory, but not on the latter theories in this essay.

⁸⁴ Plessner, Helmut. 2019. ‘The sphere of humans’ in *The Levels of the Organic and Man: An Introduction to Philosophical Anthropology*. Translated by Hyatt, Millay. Fordham University Press

of self-consciousness in the most stringent Cartesian definition. In other words, in Plessner's definition, they lack the excentric positionality that humans have.⁸⁵

Cartesian philosophy not only influenced modern thinkers; it may still help to provide new perspectives to problems posed by current technological developments. The rise of artificial intelligence (AI) and robotics confronts us with our own humanity and with questions like "what makes us essentially human?"; "Can machines have consciousness?"; and "Can future machines be distinguished from humans?"⁸⁶ Machines that pass the Turing Test, which is positive when a machine can indistinguishably respond to certain questions as a human, would be considered human-like in future. The question whether machines might be considered to attain a level of human consciousness, was also discussed by Descartes - and this already more than 300 years before Turing. In this context, Descartes proposed two tests:

If there were machines which bore a resemblance to our body and imitated our actions as far as it was morally possible to do so, we should always have two very certain tests by which to recognize that, for all that, they were not real men. The first is, that they could never use speech or other signs as we do when placing our thoughts on record for the benefit of others. For we can easily understand a machine's being constituted so that it can utter words, and even emit some responses to action on it of a corporeal kind, which brings about a change in its organs; for instance, if it is touched in a particular part it may ask what we wish to say to it; if in another part it may exclaim that it is being hurt, and so on. But it never happens that it arranges its speech in various ways, in order to reply appropriately to everything that may be said in its presence, as even the lowest type of man can do. And the

⁸⁵ It falls outside the scope of this essay to make a detailed comparison between Descartes' *res extensa* and Plessner's phenomenal things. For details see: van Buuren, Jasper.2014. 'Plessner and the Mathematical-Physical Perspective' in *Plessner's Philosophical Anthropology*. Edited by De Mul, Jos. Amsterdam University Press

⁸⁶ Bringsjord, Selmer and Govindarajulu, Naveen Sundar.2019. 'Artificial Intelligence', *The Stanford Encyclopedia of Philosophy*, Edward N. Zalta (ed.),URL = <<https://plato.stanford.edu/archives/win2019/entries/artificial-intelligence/>>.

second difference is, that although machines can perform certain things as well as or perhaps better than any of us can do, they infallibly fall short in others, by which means we may discover that they did not act from knowledge, but only for the disposition of their organs. For while reason is a universal instrument which can serve for all contingencies, these organs have need of some special adaptation for every particular action. From this it follows that it is morally impossible that there should be sufficient diversity in any machine to allow it to act in all the events of life in the same way as our reason causes us to act.⁸⁷

Descartes is thus skeptical about the possibility to build machines that are indistinguishable from humans. First, because although machines would be able to mimic speech, they lack reason to initiate the appropriate expressions and enter into a human-like dialogue. Second, because although machines can perform specific tasks, they are not able to perform in several domains and act as a universal machine, again due to a lack of reason. The important issue here is not whether Descartes was right in his skepticism or not, but that he poses two major challenges that AI researchers currently face. Indeed, although AI robots today can answer pre-defined questions, it is not yet possible to devise a machine that is spontaneous in a humanly relevant way, nor able to generate a fluent form of conversation. In addition, although AI algorithms, as Descartes rightly expected, can outperform us in very specific tasks, such as the AI algorithm “AlphaGo” for playing the boardgame “Go” or the algorithm “Deep Blue” that beat world champion chess player Kasparov in a chess game, there is no universal “Master” algorithm outperforming humans in tasks across different domains in life.⁸⁸ I would argue that Descartes’ position is that the human body can be mimicked by machines with technology, such that it can have human-like conversations or even outperform us in specific tasks.

⁸⁷ AT vi, 66

⁸⁸ Domingos, Pedro. 2015. *The master algorithm: How the quest for the ultimate learning machine will remake our world*. New York: Basic Books.

However, despite their mechanical complexity, they will never be able to acquire reason and intellect, such that it can generate adaptive language by itself or outperform us on several aspects of life. In other words, a machine clone of the human body might be developed in the future, with mimicry of all its nerves, muscles and blood, but building the human mind with its intellect and reason is independent from the material, mechanical complexity and therefore, the task of acquiring a genuine Cogito will not be achieved.

This is not a pessimistic perspective on technology, on the contrary, it is a form of technological optimism. From Descartes' perspective, we might be able to develop such technology which will enable us to build machines that will outperform us in many tasks that are non-essentially human (e.g., running, carrying weight, calculating, playing games). But Cartesian philosophy provides an answer, in this era of AI, robots and other technological advances, to the question what distinguishes us from AI machines and makes us essentially human. The Cartesian answer to this question is: the human mind, with its reason and intellect, in short, the Cogito. The discussion on the accuracy of Descartes' answers aside, it is remarkable that Descartes engaged with questions already in the late seventeenth century, that modern philosophers and scientists are still concerned with. Cartesian philosophy in this sense adds new perspectives to modern challenges that we are today faced with.

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