

The Philosophical Physiology of Descartes: Between Mechanicism and Dualism

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Abstract: There is something curious in how we perceive the Cartesian doctrine. On the one hand, we are aware that it is dualistic; on the other, that it's also mechanistic. That said, we rarely stop to ponder the fact that this is an unlikely combination from the vantage of our current philosophical mores. The contemporary dualist tends to be an antimechanicist, while the contemporary mechanicist is prone to being antidualistic. This article provides a revision of the major works of Descartes in an effort to make this doctrinal combination –the jarring nature of which we often fail to notice, if only because we are used to keeping each of its parts as if in closed compartments- more comprehensible to the contemporary reader. The survey here proposed also shows us that Descartes is a much more interesting and rich author than what the usual *clichés* about his work conceal. Thus, for example, we seriously consider the Cartesian attempt to construct a physics and physiology which would lead us to acknowledge that –contrarily to popular opinion- his metaphysical concerns are far from being at the core of his work.

Καὶ ὁ μὲν Ἰππίας ἀκούσας ταῦτα ὡσπερ ἐπισκώπτων αὐτόν,
Ἔτι γὰρ οὐ, ἔφη, ὦ Ζωκράτης, ἐκεῖνα τὰ αὐτὰ λέγεις, ἃ ἔγω
πάλαι ποτέ σου ἤκουσα; Καὶ ὁ Σωκράτης, Ὁ δέ γε τούτου
δεινότερον, ἔφη, ὦ Ἰππία, οὐ μόνον ἀεὶ τὰ αὐτὰ λέγω, ἀλλὰ
καὶ περὶ τῶν αὐτῶν.

Jenofonte, *Memorabilia*, IV, iv, 6

*Vous savez l'histoire. Pourtant nous la dirons en-
core. Toutes choses sont dites déjà; mais comme
personne n'écoute, il faut toujours recommencer.*
Gide, *Le traité du Narcisse*

It could be said that the great anti-Cartesian gyre distinguishing contemporary philosophy began, at the very least, with the early works of Charles Sanders Peirce (written in the 1860s)¹. The most consistent attack furbished by this anti-Cartesianism is aimed at the doctrines of mechanism and dualism. Oddly, it is not the same thinkers who attack both of these doctrines: in fact, those who charge against mechanism are wont, whether implicitly or explicitly, to assume a sort of dualism, while those attacking dualism are prone to implicitly or explicitly assume a mechanistic sort of approach. This is so to such an degree that it is hard for us to imagine a contemporary mechanist who could be a dualist at the same time, or a contemporary dualist who could be a mechanist. In such a way, it is the case that every anti-Cartesian is, in his own, and perhaps despite himself, a Cartesian; or, to phrase it even more provocatively: all anti-Cartesians seem to be semi-Cartesian. That is why it is surprising that the question of how Descartes could be both things has not as yet been clearly phrased. And even so, it is only by addressing this question that we may hope to understand his thinking.

The first step towards understanding the two faces of Cartesianism demands that we make clear that neither Descartes' dualism or mechanism are that which current anti (or semi) Cartesians contest. That Descartes' mechanism is not that which modern mechanists (whether in the realms of artificial intelligence or the philosophy of mind) strive to construct has been said many times, in myriad ways; indeed, it is sufficient to reflect on the fact that the conceptions of physics have suffered greatly since the time of Descartes to realize that Newtonian mechanics had already taken anoth-

¹ Cf. Leal, Fernando, "Entre la ironía y la autofagia: reflexiones sobre el postmodernismo en filosofía", in: Orozco Barba, Humberto (coord.), *Postmodernidad en el mundo contemporáneo*, Guadalajara: ITESO, 1995, pp. 27-79.

er form, to which XIXth century physics incorporated the theories of electromagnetism and thermodynamics, not to mention the transformations that both doctrinal bodies were subjected to with the relativistic and quantum developments of our own century. It is clear that an attempt to make a mechanistic philosophy in our time should assume another form, as is, in fact, the case². The question of dualism has met with less fortune, but recent investigations³ have shed a decisive light on the enormous distance between the dualism defended by Descartes and the doctrine that has been imputed to him, especially in the Anglosaxon world⁴. In fact, the recent investigations to which I here refer clearly reveal something that should be clear to anyone who has ever read Descartes, namely, that he never claimed that animals lacked a *consciousness* as such, but only that they wanted for *reason*; what happens is, we must distinguish between the type of consciousness that is bound to reason and that is more appropriately termed as *thought*, and the kind of consciousness that is bound to sentience, as well as the imagination that derives from it and produces what, as we shall see, Descartes termed as the “corporeal memory”⁵.

It is because of this that we might say that we are urgently faced with two complementary philosophical tasks: the first, of an historical character, demands that we rebuild the Cartesian endeavour in its own terms, that is to say, that we understand how the dualism and mechanism that were

² Refer, for example, to Churchland, Patricia and Terence Sejnowski, *The Computational Brain*, Cambridge, Mass.: MIT Press, 1992; Penrose, Roger, *Shadows of the Mind: a Search for the Missing Science of Consciousness*, New York: Oxford University Press, 1994; Churchland, Paul, *The Engine of Reason, the Seat of the Soul: a Philosophical Journey into the Brain*, Cambridge, Mass.: MIT Press, 1995.

³ Cf. Baker, Gordon and Katherine J. Morris, *Descartes' Dualism*, London: Routledge, 1996.

⁴ The *locus classicus* is naturally Gilbert Ryle (*The Concept of Mind*, London: Hutchinson, 1949), whose powerful image of the “ghost in the machine” would invite us to think of it as being mechanistic without being dualistic, if it weren't for the fact that its text presents no evidence of mechanism. On the other and, it is convenient to insist in what we said before, to the effect that all of contemporary philosophy is infused with anti-Cartesianism, as may be seen in figures as different as those of Peirce, Heidegger and Wittgenstein (cf. Leal, Fernando, “Entre la ironía y la autofagia: reflexiones sobre el postmodernismo en filosofía”), neither of whom, it must be said, promote mechanisms of any sort.

⁵ And even so, we are met with rather tentative moments, such as that in Art. 50 of the *Passions of the Soul*, in which it is said of “the beasts” that they “do not have reason, and *perhaps* not even thought” (Alquié, Ferdinand (ed.), *Œuvres philosophiques de Descartes*, 3 volumes, Paris: Garnier, 1963/1967/1973, volume III (1643-1650), p. 995; *AT*, p. 369). All of the phrases in quotation marks are textual quotations, as translated by myself (from the original French or Latin, depending on the source). Whenever it is possible, I shall make reference to the page or pages of the canonical edition by Adam & Tannery preceding it with the customary abbreviation *AT*, albeit sans detailing the respective volume.

specific to Descartes came to conform a system of thought; the other, of a systematic nature, posits whether it is possible to construct a philosophy of mind on the basis of an alliance between dualism and mechanicism, as currently understood. Thus, for example, the system ushered by Sir John Eccles is unquestionably an attempt to maintain an updated combination of these two philosophemes⁶, and everything seems to point to the fact that this is not a system that we can dismiss with a leer, as one of his earlier critics has recently acknowledged⁷; and the most recent discussions concerning the viability of “resurrecting” Aristotelian doctrines in order to build a non-Cartesian variant of functionalism⁸, as in the need to distinguish between the “easy” problems in the theory of consciousness and its “difficult” counterpart⁹, should make us wary of the idea that the problem we inherited from Descartes is but a mere conceptual confusion, as has frequently been claimed. The systematic task not only –and by far– exceeds what it is possible to do within the breadth of a work as exiguous as the present; it should also be noted that the way in which I pose epistemological and ontological problems steers in quite a different direction¹⁰. On the contrary, the historical task can be fairly described here, considering that it is rather independent from the systematic one and that it is possibly, if not indispensably, at least quite useful for the undertaking of the latter. In any case, it is an unavoidable intellectual obligation because, as Burnyeat already said in his attack on neo-Aristotelian functionalism¹¹, Descartes bestowed us with the problem of dualism (or, better yet, with that of dualism-mechanicism) due to the transformation suffered by the concept of matter itself; which, in referring to “mass in movement”, proves radically different to the Aristotelian one, understood as the “substrate of the categories”. The two are so “incommensurable”, as the fashionable term would have it, that, even if we could grasp the meaning of Aristotelian matter by virtue of a philological-hermeneutic effort, it could never be our own. And since we must

⁶ Cf. Eccles, Sir John, *How the Self Controls Its Brain*, Berlin: Springer, 1994.

⁷ Cf. Cotterill, Rodney, “On the Unity of Conscious Experience”, in: *The Journal of Consciousness Studies*, 2 (1995), pp. 290-311.

⁸ Cf. Nussbaum, Martha and Amélie R. Rorty (eds.), *Essays on Aristotle’s De anima*, Oxford: Clarendon Press, 1995.

⁹ Cf. Chalmers, David *et al.*, “Explaining Consciousness: the Hard Problem”, in: *The Journal of Consciousness Studies*, 2 (1995), pp. 194-288; cf. Chalmers, David, *The Conscious Mind: in Search of a Theory*, New York: Oxford University Press, 1996.

¹⁰ Cf. Shipley, Patricia and Fernando Leal, “The Active Self: Beyond Dualism”, in: *History and Philosophy of Psychology Newsletter*, 13 (1991), pp. 4-16; cf. Leal, Fernando and Patricia Shipley, “Deep Dualism”, in: *International Journal of Applied Philosophy*, 7 (1992), pp. 33-44; cf. Leal, Fernando, “Hacia una nueva filosofía del trabajo”, in: *Debate feminista*, 7 (1993), pp. 129-167.

¹¹ Cf. Nussbaum, Martha and Amélie R. Rorty (eds.), *o.c.*

avoid being misled, the notion of matter in Descartes is not just his – inevitably, it is also ours–. Whether we like it or not, we need an answer to Descartes’ problem; and insofar as any philosophical issue can be pressing, this one is¹².

Perhaps the most interesting aspect to this reconstruction of the dualistic-mechanistic combination that’s peculiar to Descartes is its early formulation and the surprisingly consistent manner in which the author defended it throughout his fruitful philosophical career. Indeed, we can find evidence of this combination in what is doubtlessly his first major endeavour, the *Regulae ad directionem ingenii* of 1628 (interrupted when Descartes was merely 32). It is developed with considerable detail in his second book, *Le monde* of 1633 (interrupted at the age of 37). In his third –and first published– work (at age 41), the *Discours de la méthode pour bien conduire sa raison, et chercher la vérité dans les sciences, plus la Dioptrique, les Météores et la Géométrie qui sont des essais de cette méthode* of 1637, we are met, on the one hand, with an outline of it –found within the *Discours* proper– and, on the other, with a partial, albeit detailed, development of it (namely, as pertains to the problem of visual perception) in the *Dioptrics*. Another account of it appears in the sixth of his *Meditationes de prima philosophia* of 1641, finished and issued at the age of 45, and published with objections and retorts a year later, it being the case that some of the replies to the objections referred to details going well beyond the adumbrations of the sixth *Meditation*. Everything seems to indicate that the unfinished dialogue *La recherche de la vérité par la lumière naturelle* (probably written at about the same time as the *Meditations*) would contain at least a draft, perhaps a partial development, of the doctrine. And his last great works, the *Principia philosophiae*, published in 1644, the *Description du corps humain et de toutes ses fonctions*, interrupted in 1649, and *Les passions de l’âme*, published in 1649, also contain parts of it; in fact, both the *Principia* and the *Description* were likely destined to contain the most thorough and mature presentation of it, while the *Passions* enclose its most detailed development of the dualistic-mechanistic theory of the emotions.

If we were to consider the significant scope of Descartes’ interests (relating to methodology, mathematics, music and physics), the picture I have just portrayed compels us to state –without an inkling of exaggeration– that the dualistic-mechanistic combination was, doubtlessly, the matter

¹² This urgency will become especially obvious to whoever has sincerely pondered Colin McGinn’s latest book (*Problems in Philosophy: the Limits of Inquiry*, Oxford: Basil Blackwell, 1992).

that obsessed him most; or, to put it in musical terms, the *leitmotiv* to the totality of the Cartesian *oeuvre*. It rears its head from the start of his philosophical career to the very end of it: it will not leave him in peace. This is why clarifying the peculiar dualistic-mechanistic combination on which Descartes vehemently insists is equivalent to clarifying his innermost thought, or, in Heidegger's own words, *sein zutiefst Gedachtes*. In Book IV of his *Memoirs of Socrates*, Xenophon records that the sophist Hippias complained to the Athenian philosopher that he was always saying the same things, to which the latter replied that he did not just say the same things, but that he always talked about the selfsame issue. Something similar might be said of Descartes: sooner or later, he would end up saying the same things about the same matter. But if, as I said before, until recent years attempts have been made to reconstruct the original Cartesian dualism against that invented by contemporary anti-Cartesians¹³, this means that, despite Descartes' insistence and his repetitions, we have not been listening close enough. This is why Gide correctly said that "since no one listens, one must always retell the same story". Such is my purpose here, and I shall proceed as follows: in the first place, I shall expose the basic doctrines underpinning Cartesian dualism; in the second place, I shall preoccupy myself with the investigation on the limits of reason initiated by Descartes in his *Regulae*, which anticipates Kant's critical endeavour, with which I shall then proceed to establish certain parallels I deem to be instructive for what follows; thirdly, I shall advance my interpretation of the meaning of the meditations founded by Descartes in order to ascertain, firsthand, the non or extra-mechanical nature of the *res cogitans*; then, I shall try to set forth the mechanicism required in order to explain the *res extensa* that makes up our bodies, that is to say, the philosophical physiology of Descartes (closing with a speculation on the change that the *Treatise on the Passions* arguably introduces into the original theory of understanding contained in the *Regulae* and faithfully preserved in all of the ulterior writings); finally, I shall conclude with some considerations on a possibly dual (or maybe even triple) structure of the Cartesian dualism-mechanicism that we should postulate when contemplating the philosophical physiology in terms of the complete philosophical physics (originally introduced in the *Traité de la lumière*, partially reprised in the *Dioptrics*, completed in the *Meteors* and more conscientiously developed in the *Principia*), namely, when seen as part of a broader, more ambitious theoretical totality.

¹³ Cf. Baker, Gordon and Katherine J. Morris, *o.c.*

Cartesian Dualism in nuce: The Letters to Elisabeth

Le philosophe s'est enfin décidé à parler de l'union en commençant par ce qui était, à ses yeux, le commencement. En 1642, la princesse Elisabeth a lu les Méditations... au printemps de 1643, le médecin d'Utrecht étant venu à La Haye, elle eut un entretien avec lui; ils ont parlé de l'union de l'âme au corps; Regius lui a conseillé de s'adresser à Descartes lui-même... Cette fois, l'explication sera complète.
Gouhier

On May 2, 1643, Princess Elisabeth wrote a letter to Descartes in which she begged for him to explain to her how the soul could move the body through voluntary action, given (as Descartes claimed) that the latter was no more than a thinking thing. Elisabeth lucidly argues that for one thing to move another it is required for the first to touch the second, and for both to have a surface, that is to say, an extension and a shape, but, alas, neither of these properties could be attributed to a thinking thing; or at least, writes Elisabeth, nothing in the *Meditations* leads us to absolve this doubt¹⁴. Descartes is pleasantly surprised to witness such fine reasoning and gladly concedes that the *Meditations* fail to explain how such a thing is possible. His involved response to Elisabeth has three parts¹⁵:

- Firstly, he tells her that “there are certain primitive notions within us which are like the original patterns upon which we conform the total of our knowledge”; such notions are quite limited, and can be general –that is to say, attributed to “all the things we can conceive”, such as *being*, *number* and *duration*; or they can be particular, of which we can distinguish three types: (a) those which can be solely attributed to the body, such as *extension*, *shape* and *movement*, (b) those which can be exclusively attributed to the soul, such as *understanding* and (c) the only notion that can be attributed to both, namely, that of *union*, by means of which we can conceive of the soul acting over the body, producing the voluntary act, and of the body acting on the soul, through the mediation of the passions. For the sake of referential comfort, I shall occasionally refer to the particular primitive notions of type (a) as physical notions, to those of type (b) as psychical notions, and to those of type (c) as psychophysical notions.

¹⁴ Cf. Beyssade, Jean-Marie and Michelle Beyssade (eds.), *Descartes: correspondance avec Elisabeth et autres lettres*, Paris: Flammarion, 1989, p. 65.

¹⁵ Cf. *ibid.*, pp. 68-69; cf. Alquié, Ferdinand (ed.), *o.c.*, volume III, pp. 19-21.

- Secondly, he clarifies that the errors we incur in our reasoning are of two sorts, and come about (1) when we strive to explain one of these notions by another, as they are primitive and cannot be explained lest it be by themselves, and (2) when we try to apply one of these notions to something which does not admit it.
- Thirdly, he concludes by stating that it is this second type of error that Elisabeth incurs when she confuses “the notion of force with which the soul acts over the body” with the notion of force with which “one body acts over another”.

It could be said that the first of these points presents a new “table of categories”, destined to replace Aristotle’s, and to serve as a clear precursor to Kant’s (even if the latter would place time and extension, or space, as forms of sensitive intuition, which he distinguishes from the “categories” proper, which would be the intellectual concepts or notions). It will be helpful to keep this in mind when we come to the comparison between Descartes and Kant that I shall seek to establish further ahead.

The three points mentioned comprise the first and fundamental part of Descartes’ reply to Elisabeth, an answer we can summarize by simply saying that Elisabeth’s question, if seemingly correct, was never really raised; quite as if one were asking for the weight of the shadow one casts against a wall: the answer consists in saying that the question is erroneously posed, as the shadow is not a body, and can thus not have a weight. This purely negative retort, however, albeit correct -given the aforementioned Cartesian suppositions- fails to stanch the doubt contained in Elisabeth’s question. Being perfectly aware of this, Descartes sets forth an interesting analogy¹⁶:

- We might say there is another –doubtlessly more subtle- error underlying Elisabeth’s question, consisting in that, when we think of the force that acts over a body, whether on behalf of the soul or of another body, we do not even attribute it to the soul or to the body, but rather, to a “quality” of the body. In doing this, we tend to lend substance to this force, reasoning, for example, that weight is a real quality of a body, a quality of which we only know one thing: that it has the force to propel it to the center of the Earth. Even if this is a mistaken conception of weight, as Descartes expects to prove in his “Physics” (that is to say, what will eventually become the *Principia philosophiae*, whom he dedicated to the Princess Elisabeth herself),

¹⁶ Cf. *ibid.*, pp. 69-70; cf. *ibid.*, pp. 21-22.

gives us an example of a force for which we need not suppose that one body touches another. This analogical example -which, as Descartes textually says, “has been given us” (presumably by God) – helps us conceive (albeit obscurely) how the soul could act over the body without having to touch it.

It is with this beautiful analogy that Descartes brings his answer to Elisabeth’s question to a close. But the sharp princess is unsatisfied with his reply and in her next letter, dated June 20¹⁷, she writes that, since the ordinary explanation of weight contains a confusion on the true nature of the observed effect (the gravitation of bodies), its analogous employment when it came to conceiving the force by which the soul moves the body requires that we think this force could be attributed to an immaterial being; but that it was easier for her to grant extension and materiality to the soul than gravitational action to an immaterial being, as the soul’s capacity to move and to be moved by the body would be performed “through information”, which demanded assuming that the parts of the body that, for example, are made to move by action of the soul, should themselves be intelligent, a quality which, according to Descartes, cannot be granted to a body. Thus, at least one of two impossibilities would have to be the case: either the soul has an extension or the body is intelligent.

Challenged again by the princess’ subtlety, Descartes prepared to give a more precise explanation of his dualism-mechanicism¹⁸. He begins by saying that in his earlier letter he omitted mentioning three points, with which the complete explication should include what follows:

- The three types of particular primitive notion are different in the manner in which we come to know them, namely: psychical notions (the soul and its attributes) are only conceivable through pure *understanding*; they are, so to speak, purely rational notions, whereas physical notions (the body and its attributes), albeit conceivable through pure understanding, “can be much better known through understanding aided by the *imagination*”, and psychophysical notions (the union of the soul and body) cannot be known through understanding, not even when it is aided by the imagination, even as they can –and very clearly– be known through the *senses*.
- He proceeds to explain by which means we can make these different notions familiar and facile, that is to say (*latine loquendo*), clear and distinct. Indeed, he who never philosophizes and relies entirely on his

¹⁷ Cf. Beyssade, Jean-Marie and Michelle Beyssade (eds.), o.c., pp. 71-72.

¹⁸ Cf. *ibid.*, pp. 73-76; cf. Alquié, Ferdinand (ed.), o.c., volume III, pp. 43-48.

senses shall never question that the soul acts on the body, in other words, he shall conceive their union, with which it could be said that: metaphysical thought, which only recurs to pure understanding, allows us to become familiar with the notion of the soul; mathematical thought, which relies foremostly on the imagination, is what accustoms us to properly distinguishing between the notions relating to bodies; and it is life and ordinary conversation, where the senses are deployed above all other faculties, which allow us to conceive the union between the soul and body.

- The analogy of weight must not thus be understood in the sense of attributing the force to an immaterial being; rather, it must help us to conceive the soul as material, which is what the union of the soul and body properly consists of, without our ceasing to conceive the soul as being separable from it.

Of these three additional parts to the Cartesian reasoning (with which his entire reply –the “complete explanation” mentioned by Gouhier, comes to have seven points in total) I should wish to make a pit stop in the second. It contains the famous passages where Descartes confesses how his method depends on committing a few hours a day to mathematics, a few hours a year to metaphysics and the majority of his time to “the relaxation of the senses and the rest of the spirit”, wherein stems his decision to live far from cities and amongst simple people. We may here add that it is in this medium that the anatomical and physiological observations that would occupy most of Descartes’ free time were displayed; and we can almost imagine the *gusto* he obtained from his dealings with butchers, to whose dismemberments he constantly assisted, as well as the disgust which was so often the result of his conversations with the “educated” city folk.

It is for all of the above that the philosopher admires the princess Elisabeth, who, despite her many occupations, has decided to make time for the “meditations required to know the distinction between the soul and the body well”. With this last phrase, Descartes conveys with the utmost clarity that, in order to know not the *distinction*, but the *union* of the soul and the body, what is precisely *not* required is to meditate or practice metaphysics, but to plain and simply live¹⁹. This is also why he fears that, even if the

¹⁹ In this context, it may be interesting to remember the severe criticism that Heidegger launches against Descartes in his masterpiece *Sein und Zeit* (cf. Heidegger, Martin, *Sein und Zeit*, Halle: Max Niemeyer, 1927, §§ 19-21), which constitutes such an important part of the anti-Cartesian gyre which, as I said at the beginning of this work, distinguishes contemporary philosophy (cf. Leal, Fernando, “Entre la ironía y la autofagia: reflexiones sobre el postmodernismo en filosofía”). It is at least debata-

princess' metaphysical meditations have cleared up the distinction between soul and body to her, they are obscuring her conception of their union. And thus, Descartes concludes his reasoning by insisting that metaphysical meditations should be performed but once in a lifetime, since overindulging in them is pernicious, and leads to the overlooking of the thoughts in which the understanding interacts with the imagination and the senses, which is the best use it can be given for the rest of one's life.

I believe there is no other text as enlightening as this one in the whole Cartesian *oeuvre*, even as one must admit that the princess was not entirely persuaded by it and demanded further explanations in a letter written on July 1²⁰. Whether Descartes responded to this third inquisition is unknown, as there is no evidence to point us one way or the other. For my own designs, however, what has been said will quite suffice, as it affords us with a clear testimony of two critical points:

- Imagination and the senses, of which the understanding serves itself whenever it is not committed to metaphysical meditations, are susceptible to a mechanistic explanation. On the other hand, the understanding as such (the pure understanding, that is) is identical to the soul, and thus the explanation of its pure operations overwhelms mechanicism. But this is not too grave, since these pure operations are extremely limited in scope, and the metaphysical meditations are enough to help us comprehend how the understanding operates when functioning alone. The mechanical explanation of the imagination and the senses, on the other hand, helps explain how the understanding

ble (albeit there is no space here to develop the argument as is meet) that the phenomenological attitude is merely a methodological adoption of this "plain and simple living" (for the purposes of philosophy). Hence Husserl's saying that phenomenology works by putting science, and all theory in general, between parentheses, corresponds to some extent to the "natural attitude" (see, for example, Husserl, Edmund, *Ideen zu einer reinen Phänomenologie und phänomenologischen Philosophie*, Halle: Max Niemeyer, 1913, § 1), even as it could be said that there is some degree of ambiguity in the Austrian philosopher, as he tends to compare the phenomenological endeavour with the *Meditations*, of all texts (see ahead), which would represent a total contradiction in Cartesian terms, as there is nothing more opposed to metaphysical studies than the natural attitude. It may be this ambiguity -hence, this misunderstanding- that Heidegger's "existential" swerve tried to save Husserl from. The matter is, however, complicated, insofar as, even when Husserl -as we know-came to adopt the "existential" spin with his late concept of *Lebenswelt* (which he refloats in his *Krisis der europäischen Wissenschaften* of 1936), he insisted, almost at the same time, on the connection between phenomenology and metaphysical meditations (in his *Kartesianische Meditationen* of 1931). This may all become clarified with the recent publication of the notes that Husserl made to his copy of *Sein und Zeit*.

²⁰ Cf. Beyssade, Jean-Marie and Michelle Beyssade (eds.), o.c., pp. 77-78.

operates when it does *not* function alone, but rather, in collaboration with the above.

- Descartes' mechanicism has a *mathematical* origin and is the product of a type of reasoning that mainly involves the understanding in cooperation with the imagination, operating on the material that is afforded us by the senses. Cartesian dualism, on the other hand, has a purely *metaphysical* origin and is the result of a peculiar sort of meditation in which the understanding operates alone, without the aid of the imagination or the senses.

These two points fully and entirely contain the peculiar combination of dualism and mechanicism that is Descartes' crucial philosophical obsession. I shall now proceed to, first, describe how it is that the metaphysical meditations (performed through pure understanding) produce the knowledge of the distinction between the soul and the body, hence, *dualism*; then, how the philosophical physiology of Descartes (executed by the understanding in cooperation with the imagination and the senses) produces knowledge of the body, and with it, of the cooperation of the understanding with the imagination and the senses, that is, the *mechanistic* explication of the body and, hence, of the imagination and the senses. This exposition will have to clarify the transition which leads Descartes from the *Regulae ad directionem ingenii* –in which the issue of the cooperation of the understanding and the imagination is conceived as part of a methodology of mathematics- and the philosophical physiology that was barely hinted at in the *Regulae*, and later staunchly developed in the *Traité de l'homme*, and more incompletely addressed in ulterior writings. As for the union of body and soul, Descartes need not produce any theory for it, since the conception of such a union is, in itself, not an object for theory (but merely for ordinary experience), from which it follows that his mechanicism has the sole purpose of assigning the place of the body there where the action of the soul over the body and the body over the soul is produced: namely, the notoriously discredited pineal gland.

Semel in vita I: *The Critical Endeavour as Established in the Regulae ad directionem ingenii*

*Nec manus nuda, nec intellectus sibi permissus,
multum valet; instrumentis et auxiliis res perficitur;
quibus opus est, non minus ad intellectum, quam ad
manum. Atque ut instrumenta manus motum aut
cient aut regunt; ita et instrumenta mentis intellectui
aut suggerunt aut cavent.*

Bacon, *Novum Organum*, I, II

Anschauung und Begriff machen also die Elemente aller unserer Erkenntnis aus, so dass weder Begriffe, ohne ihnen auf einige Art korrespondierende Anschauung, noch Anschauung ohne Begriffe, ein <sic> Erkenntnis abgeben können... Ohne Sinnlichkeit würde uns kein Gegenstand gegeben, und ohne Verstand keiner gedacht werden. Gedanken ohne Inhalt sind leer, Anschauungen ohne Begriffe sind blind.

Kant, *Kritik der reinen Vernunft*, A50-51, B75-76

Descartes had told the princess that metaphysical meditations should be undertaken only once in life. This famous phrase of 1643, however, is already featured in the *Regulae ad directionem ingenii* of 1628 (that is, fifteen years earlier) in what would seem to be a different context –that of rule 8, where it is said that “if in the matters to be examined we come to a step in the series of which our understanding is not sufficiently well able to have an intuitive cognition, we must stop short there. We must make no attempt to examine what follows; thus we shall spare ourselves superfluous labour”. In the exposition of the contents, scope and meaning of this rule, Descartes tells us that beginners are taught not to work futilely, rendering it almost identical to rule 2 (“only those objects should engage our attention, to the sure and indubitable knowledge of which our mental powers seem to be adequate”), except that to those who have already mastered the previous seven steps it says something new: that for those who have cultivated knowledge by the strict application of these seven rules, rule 8 orders that they stop at a certain point because “no amount of application will enable him to attain the knowledge desired”, that is, he teaches them that there is a limit to human knowledge that does not depend on the particular ingeniousness of the investigator but on the “the nature of the problem itself”, or on “the fact that he is human”²¹.

This text resonates with the signal endeavour of modern philosophy from Descartes to Kant, namely, the need to establish the limits of human reason. The task that is thus given us (or better yet, that is awarded to the

²¹ Descartes, René, *Regulae*, VIII, 2; *AT*, p. 393. In the following referents, the Roman numeral shall refer to the rule and the Arabic number to its expository paragraph. I thus adhere to the philological procedure used in Meiner’s splendid critical edition of the *Regulae* (Springmeyer, Heinrich, Lüder Gäbe and Hans Günter Zekl (eds.), *Descartes: Regulae ad directionem ingenii*, Hamburg: Felix Meiner, 1973), even as I am quick to note that said edition also separates two considerable passages of rules 4 and 8 –which are presented as appendixes- for philological reasons.

minds that have already worked methodically) is one that need be undertaken *semel in vita*, “once in life”²². *More Socratico*, Descartes compares it to the “mechanical crafts”, where one must first forge the instruments to work with –as in the case of the anvil, the hammer and the smith’s tongs- by resorting to given materials –iron, rock and wood- with which the smith may then fashion the instruments required by the work at hand: analogously, we should not leap to “settle the Controversies of Philosophers or the puzzles of the Mathematicians”, but should rather commit our best efforts to “all the other things that are more urgently required in the investigation of truth”²³. For this intermediate task –the one analogous to the smith’s instrumentalia- “no more useful inquiry can be proposed than that which seeks to determine the nature and the scope of human knowledge”. This question can be tackled with what the seven previous rules have placed at our disposal (let us say, the smith’s stone, iron and wood). Whoever “has the slightest regard for truth” should undertake this intermediate *semel in vita*, “once at least in life”. And with a turn of phrase that is intensely reminiscent of Kant, he warns the reader that “nothing seems [...] more futile than the conduct of those who boldly dispute about the secrets of nature, the influence of the heavens on these lower regions, the predicting of future events and similar matters [...] without yet having ever asked whether human reason is adequate to the solution of these problems”²⁴. For, according to Descartes, this task must be divided into two parts, one of which relates “to us who are capable of knowledge”, the other of which is aimed at “the things themselves which can be known”²⁵.

We shall not concern ourselves with the second part of what can, somewhat anachronically, be termed the “critical” investigation triggered by Descartes. Its first part, however, interests us greatly, as it shall lead us in due time to the philosophical physiology of Descartes. This is actually the

²² Descartes, René, *Regulae*, VIII, 3; AT, pp. 396-397.

²³ *Ibid.*, VIII, 4; *ibid.*, p. 397.

²⁴ The reasons which led Descartes to thus inaugurate the tradition of investigating the limits of human reason and knowledge (a veritable *Weltereignis*) have been punctually researched by Lüder Gäbe (*Descartes’ Selbstkritik: Untersuchungen zur Philosophie des jungen Descartes*, Hamburg: Felix Meiner Verlag, 1972): everything seems to indicate that the immediate trigger for it was the dispute between the directors of two famous schools about the possibilities of astrological predictions (hence Descartes’ curious listing of examples), albeit a more profound circumstance may just as well have been the fact that Kepler had founded his theory of the universal harmony (1619) –and thus his astrology- on the opinion that elemental geometry was superior to algebra and analysis, an opinion that the future creator of analytical geometry could hardly partake of (cf. Springmeyer, Heinrich, Lüder Gäbe and Hans Günter Zekl (eds.), *o.c.*, pp. 193-194).

²⁵ Descartes, René, *Regulae*, VIII, 5; AT, pp. 397-398.

place where he for the first time resorts to the notion of the “understanding [...] helped [...] by [...] imagination, sense and memory”, there where he tells us that the understanding, even as it is alone “capable of knowing”, can be helped (or hindered, which is important, even if he did not mention it to the Princess Elisabeth) by the imagination, the senses and memory. Before we proceed, we should insist on the outstanding fact that, come this point, Descartes mentions not *two* faculties (the imagination and sense), as we had supposed up to here, but *three*, through the addition of memory. This is a complex and delicate matter, all the more so since it has a venerable precedent in Aristotle. I am here referring to the minor scandal that was produced by the fact that in all of the text of *De anima* the concept of memory (μνήμη) did not appear as much as once. It is true that the small treatise that is *De memoria* partially amends this fault, but even so, it is not at all clear whether this a faculty different from the imagination, or a mere manifestation of the imagination or the understanding²⁶. This Aristotelian ambivalence reappears in Descartes, who will later say that “the memory, at least that which is corporeal and similar to that of the brutes, is in no respect distinct from the imagination”²⁷. We shall return to this enigmatic phrase.

The critical endeavour thus comprises knowing how to distinguish how each of these faculties can be a hindrance or an aid (*obesse vel prodesse*), so that we may make the most of them²⁸. Now, the following three rules come to develop, as is known, a small theory of the qualities which must apply inventiveness to the investigation of the matters that are brought to it, namely, “perspicacity” (rule 9), “sagacity” (rule 10) and “capacity” (rule 11). We are quick to remember the parallel theory developed by Kant in his *Kritik der reinen Vernunft* concerning the triple distinction between reason, understanding and judgment, even if it is at heart quite different and far more involved²⁹. Be as it may, it is not until rule 12 that Descartes promises to properly analyze the relationships between the understanding and the imagination-sense-memory triad³⁰. The author says

²⁶ Cf. Aristotle, *De memoria*, I, 450a.

²⁷ Descartes, René, *Regulae*, XII, 11; *AT*, pp. 416-417.

²⁸ Cf. *ibid.*, VIII, 6; cf. *ibid.*, p. 399.

²⁹ The careful reader shall remember the discussion on the two types of wit or lack thereof (to reprise the generic Cartesian concept in this context) corresponding to the faculties of understanding and judgment advanced at the beginning of the Second Book of the “Transcendental Analytic” (A132-136, B172-175), later completed by the more elaborate theory of the wit or lack thereof which constitutes the doctrine of the “Transcendental Dialectic” (cf. especially with the Introduction, A293-309, B349-366).

³⁰ Cf. Descartes, René, *Regulae*, XII, 2; cf. *AT*, p. 411.

that he would like to have “explained in this passage what the human mind is, what body, and how it is ‘informed’ by mind; what the faculties in the complex whole are which serve the attainment of knowledge, and what the agency of each is”, but that he does not count with the space to do so without going into controversies, which, as is known, Descartes abhorred³¹. Because of this, he shall content himself with presenting his ideas as hypotheses (*suppositiones*) in which the reader may believe if it behooves of him to do so, but which he can admit as clarifiers on the matter³². This procedure is no different to that adopted by Descartes in *Le monde* or the *Principia*.

The hypotheses are five:

- The external senses, as pertains to the parts of the bodies, are passive, despite our being able to move them actively towards the objects we wish to perceive. This passivity (which Kant terms “receptivity”) is compared to the action of a seal over wax; an analogy that hails to the Ancients and which Descartes asks that we take literally: the exterior corporeal object acts corporeally over the corporeal organ. This is valid for all senses, with the clearest case being that of touch (figure, hardness, roughness can be readily imagined by shaping the skin they touch); but rings equally true for other instances, for example, the luminous and coloured object (light conceived in a corpuscular manner) that acts over an initially opaque part of the eye, or how sound, smell and taste produce a “new figure” in the “first membrane” of the ears, nose and tongue, with this “first membrane” being originally impenetrable to the sonorous, odorous or savoured object³³. The difficulty of imagining these other cases is breached by Descartes by using the figure in the case of touch as a sort of universal medium for codification³⁴. This last proposal gives a first showing of classical mechanicism (see ahead).
- The figure thus received by the external organ is transmitted to the “common sense” (an Aristotelian concept, as is known). This happens simultaneously, as when we write and, in moving the inferior tip of the pen, also chance to move its upper end³⁵.
- The figure thus received by the “common sense” acts itself as a seal upon the imagination (*phantasia vel immaginatio*), which must be

³¹ *Ibid.*, XII, 3; *ibid.*, pp. 411-412.

³² *Cf. ibid.*, XII, 4; *cf. ibid.*, p. 412.

³³ *Cf. ibid.*, XII, 5; *cf. ibid.*, pp. 412-413.

³⁴ *Cf. ibid.*, XII, 6; *cf. ibid.*, p. 413.

³⁵ *Cf. ibid.*, XII, 7; *cf. ibid.*, p. 414.

conceived as a “genuine part of the body, of sufficient size to allow its different parts to assume various figures in distinctness from each other”, with the added ability to “let those parts acquire the practice of retaining the impressions for some time”. In this last sense, the imagination can be also known as memory³⁶.

- The imagination is located in the brain and the parts of the body with which the “common sense” acts upon them are the “nerves themselves” “originating in the brain, once again as if the upper end of the pen moved at the same time as the lower end. This hypothesis helps us see that the imagination itself “can be the cause of many motions in the nerves, motions of which, however, it does not have the images stamped upon it”, just as the upper end of the pen moves in a direction that is opposite to that of its lower end. Hence the operations of the animals, who do not possess knowledge, but who do have “fancy of a purely corporeal kind”; hence, too, the operations of humans that are performed “without any aid from the reason”³⁷.
- “That power by which we are properly said to know things, is purely spiritual, and not less distinct from every part of the body than blood from bone, or hand from eye”, and it is but a single agency, “whether it receives impressions from the common sense simultaneously with the fancy, or applies itself to those that are preserved in the memory, or forms new ones” in the imagination, independently of the common sense or the operation. In all of these cases, the analogy of the seal and the wax (both of which roles could be invested with that power) should not be taken literally, as there is nothing in “corporeal things” that corresponds to these actions. This “power” is bestowed with different names according to whether it cooperates with the different parts of the body, but it is properly known as “mind” when it gives rise to new ideas in the imagination or busies itself with those preserved in the memory. Hence the need to distinguish correctly between these modes of cooperation in order to learn how to use them in the investigation of the problems that are presented to the mind³⁸. It is particularly important to distinguish from all of these modes of cooperation that in which the mind operates on its own, which is what we term “understanding”; and so the task will come to ordain the method: an imaginative, even sensory one, when dealing with corporeal

³⁶ *Ibid.*, XII, 8; *ibid.*

³⁷ *Ibid.*, XII, 9; *ibid.*, pp. 414-415.

³⁸ *Cf. ibid.*, XII, 10; *cf. ibid.*, pp. 415-416.

objects, tracing clear and simple geometric figures for some mathematical problems, for example; or a purely intellectual approach that is avoidant of images and reduces problems to an algebraic, symbolic form for the boarding of other types of mathematical problems³⁹.

As is known, the imaginative-sensual or geometric method, which relates to the first type of mathematical problems, corresponds to the one drafted in the Second Book of the *Regulae*, of which we preserve only nine of the twelve rules foreseen⁴⁰, whereas the intellectual or analytic-algebraic method, relating to the second type of problems, corresponds to its planned Third Book, of which no rules exist at all. As compensation for this absence we naturally count with the essay on geometry that is annexed to the *Discours*. We must, however, resist the temptation to continue reading and return to the particular problem that is posed here: the combination of dualism and mechanicism that is characteristic to Descartes assumes its first, clear, literary form in these five hypotheses, even as we must realize the important differences regarding the ulterior system (better known as Descartes' "classical system"). These important differences are two:

- Descartes' classical dualism presupposes a theory of "primitive notions" innate to the soul, of which we can obtain the highest possible evidence, an evidence equal or greater to that of mathematical propositions themselves. This classical dualism is the byproduct of the famous revelation that occurred to him during the winter of 1628, which he reported biographically in the *Discours* and developed later in the *Meditations*.
- The classical mechanicism of Descartes reduces the agency of external corporal objects over the sense organs, as well as all the internal actions of the body and its different parts (the common sense, the imagination, corporeal memory, movement) with the soul, to pure mechanisms, that is, to masses set into motion by specific impacts. In the *Regulae*, however, he still ponders on different "figures" or "ideas" for the different sensorial qualities impressed by external corporeal objects upon the organs, even if the notion of "figure" peers in tentatively, at the end of the first hypothesis, as a sort of universal means of codification. This is the first step, to be completed by the idea that the manner of agency of the external objects over the organs is purely

³⁹ Cf. *ibid.*, XII, 11; cf. *ibid.*, pp. 416-417.

⁴⁰ Cf. *ibid.*, XIII-XXI; cf. *ibid.*, pp. 430-469.

mechanic. Such will be Descartes' attempt in the *Traité de l'homme*, as well as in his later works.

Classical dualism and mechanicism will be the topic of the next following sections. The one thing I should like to remark before moving onto them is the fact that, in the *Regulae*, Descartes already insists not just on what we might term the purely mental interactions between the intellect and the common sense, the imagination and the corporal memory, but also in the more obviously corporeal agencies of these faculties when involving the movement of the body, that is to say, agency over the muscles. And I should like to underscore this because it is the perennial temptation of philosophers to forget that bodies are not merely the "sites" for these faculties, but quite specifically muscled bodies that move within the world and that affect it. This temptation harkens to the ideal of the contemplative life which tends to separate itself from the active one as a superior lifestyle, a distinction that's responsible for the contrivance of an epistemology and that are incapable of accounting for practical knowledge⁴¹. And even if, to some extent, Descartes partakes of such an intellectualistic prejudice, we may also say that he perpetuates a naturalist tradition that can be traced back to Aristotle and that he is less blind to the facts of life than his successors⁴².

Semel in vita II: *The Spiritual Exercises of Saint Renatus*

[T]he person who gives to another the way and order in which to meditate and contemplate, ought to relate faithfully the Events of such Contemplation or Meditation, going over the points with only a short or summary development. [For...the person making the Contempla-

⁴¹ Cf. Shipley, Patricia and Fernando Leal, o.c.; cf. Leal, Fernando and Patricia Shipley, o.c.; cf. Leal, Fernando, "Hacia una nueva filosofía del trabajo".

⁴² To not give more than one example of what it is I want to say by this, let us consider the Cartesian proposal that, when faced with certain problems, the imagination aids the understanding by reducing the question through the exclusive use of straight lines and rectangles, which are easier to conceive (cf. Descartes, René, *Regulae*, XIV, 24; cf. *AT*, p. 452; cf. *ibid.*, XV; cf. *ibid.*, pp. 453-454). The philosophical alternative advanced by the Erlangen school which helps explain our Euclidean tendencies in terms of the facility of certain operations and the naturalness of certain practices is, to my eyes, more promising (refer, for example, to Inhetveen, Rüdiger, *Konstruktive Geometrie: eine formentheoretische Begründung der euklidischen Geometrie*, Mannheim: Bibliographisches Institut, 1983; Lorenzen, Paul, *Elementargeometrie: das Fundament der analytischen Geometrie*, Mannheim: Bibliographisches Institut, 1984; Janich, Peter, *Euklids Erbe: ist der Raum dreidimensional?*, Munich: Beck, 1989; for a more general epistemological frame, see Leal, Fernando, "Hacia una nueva filosofía del trabajo").

tion] will get more spiritual relish and fruit than if he who is giving the Exercises had much explained and amplified the meaning of the Events. For it is not knowing much, but realising and relishing things interiorly, that contents and satisfies the soul.
Ignacio de Loyola, *Spiritual Exercises*, Second Annotation

The metaphysics of Descartes are, without a doubt, the most studied aspect by his successors, to the extent that it has even been said that “the metaphysical argumentations contained in the *Discours*, and largely expanded by the *Meditations*, are the philosophical kernel of the Cartesian philosophical system”⁴³. This phrase conveys the grave misunderstanding that’s shared, up to the present day, by most analytical philosophers, despite the recent wave of “naturalization” which, at least in the realm of epistemology (considering the same cannot be said for ethics), is more closely in agreement with the true Cartesian spirit. I shall return to this immediately, not without first mentioning that even as this erroneous consensus probably ensures that readers are at least stiltedly aware of the contents of the *Meditations*, they are also very likely misinformed about their spirit. On this merely instrumental count, and because it seems to me that such a preconception is part of an intellectualist bias which not only blinds us when confronted by systematic problems, but also hinders our thorough comprehension of the philosophical endeavour of the historical Descartes, I shall not stop to discuss the details of his metaphysics. Indeed, I shall only speak of it in order to insist upon the fact that the Cartesian dualism exposed in the *Meditations* is radically incomplete unless it is seen as the side of a coin, the other side of which is mechanicism. In this sense, it is quite curious to observe that most discussions on the *Meditations* seem to overlook the Sixth of them, which is where that other side to the coin is introduced, or at least those parts of the Sixth Meditation in which physiological matters are dealt with. I shall thus take for granted that the “argumentation” (and it shall shortly be seen why I put this word between quotation marks) of the *Meditations* –especially that of the first five ones– is known, and shall concern myself exclusively with offering an interpretation of the true nature of the *Meditations* in the frame of the Cartesian critical endeavour, which I shall compare to its critical Kantian counterpart as developed by the Friesian school, an approach I deem to be deserving of continuation in our own time, with the help of the latest findings in the cognitive sciences and physiology in general.

⁴³ Cottingham, John, “Descartes”, in: Honderich, Ted (ed.), *The Oxford Companion to Philosophy*, New York: Oxford University Press, 1995, pp. 188-192.

My main thesis is that the Cartesian critical endeavour demands two types of complementary investigations. In order to explain the nature of these two kinds of studies, I shall lay hand to a very useful distinction introduced into contemporary philosophy by the German philosopher Ernst Tugendhat in the realm of ethical reflection⁴⁴. It concerns what one might think, believe or argue in the *third person* faced with what can be done in the *first person*. The third person is typical of the scientific disciplines and can thus be used, for example, in relativistic or historicist argumentations: by way of anthropologic or historic considerations, I can distance myself from my own sociocultural context and declare the moral ideas with which I have grown in relation to that context, which is dubiously compelling, or criticize them in the likeness of what Trasimachus already essayed in Ancient Athens⁴⁵, a gesture repeated by other authors such as Marx, who argued these ideas had been imposed by an aristocratic class in order to maintain the oppression of the masses, or –contrarily– by authors such as Nietzsche, who claimed they had been imposed by these very masses in order to reap benefits from the aristocratic and superior class. This is all very well, says Tugendhat, and it is useful as a part of a social theory with a critical, emancipating impulse. Deploying this approach, however, makes it impossible for us to think or argue in an ethical sense, since moral beliefs thus attacked lose all validity, and not because of the critique itself (which might be mistaken), but because they are formulated in the third person. Indeed, for beliefs and moral judgments to have validity as such, they need to be assumed in the first person; without them, there is no ethical argumentation proper and the most we can aspire to reach is the elimination of all morals (which would be full-bodied relativism), insofar as the aforementioned social theory is incapable of opposing other, valid, beliefs to it –as these, themselves, would have to be assumed in the first person-. The same argumentation can be applied, of course, to other forms of relativism or historicism, namely, those which are not destined to criticize our moral beliefs but any other type of knowledge.

My thesis, then, is that the *Meditations* do not constitute, *stricto sensu*, a book that we can calmly analyze (as it is usually done) from the outside and in the third person, criticizing the validity of this or that argumentation. Rather, we are faced with a narrative: that of Descartes' experience in crafting it; a story that cannot in fact be anything other than an invita-

⁴⁴ Cf. Tugendhat, Ernst, "Una nueva concepción de filosofía moral", in: Sobrevilla, David (comp.), *El derecho, la política y la ética*, México: Siglo XXI/UNAM, 1991, pp. 151-173; cf. Tugendhat, Ernst, *Vorlesungen über Ethik*, Frankfurt: Suhrkamp, 1993.

⁴⁵ Cf. Plato, *The Republic*, Book I.

tion for us to perform this sort of meditations *semel in vita*, “once in life”; but that we perform them ourselves, at our own risk, and not vicariously through the Cartesian narration. In this sense, the *Medidations* belong to the tradition of “spiritual exercises” which can be traced, in the West, as far as Greek Antiquity (at least up to Socrates) and which constitute such an important part of the teachings of Hellenic philosophy⁴⁶. This sort of “spiritual exercises” were developed, in parallel to the Ancient Greek efforts already mentioned, during the classical epochs of Orient, especially in India, but also in China and in other countries. They were retaken by diverse religious orders of Christian Europe, one of which was that in which the young Descartes was schooled. I refer, of course, to the “spiritual exercises” of Saint Ignatius. The latter, as those which are proposed to us by Descartes, demand to be performed by every person in particular, through their own experience, which can in no way be replaced by the mere reading and discussion of Saint Ignatius’ text. Whoever stops to think of this will realize that the very notion of such a substitution proves perspicuously ridiculous in a case such as this. I sustain that it is equally ridiculous in the case of the Cartesian *Meditations*: it is only he who has subjected himself to this rigorous discipline (a discipline so rigorous that it should be undertaken but “once in life”) who can give his opinion on the validity or invalidity of what Descartes himself found in the course of such meditations. There is no guarantee, of course, that whomever performs them as Descartes indicates shall arrive to identical conclusions; just as nothing guarantees that, in the case of Saint Ignatius’ “spiritual exercises”, or as regards those proposed by Socrates, Confucius, the Buddha, the Stoic, Epicurean or Neoplatonic schools, he who puts them into practice on his own shall arrive to the same results as these thinkers, who every time declare them to have been their own lived experience⁴⁷. The utmost they can say is that their own experience proved to be so clear and perfect that they are bound to think that whoever proceeds in the same way, in their own time, shall be met by the same thing that they found. It is quite different, of course, to presume that to pursue such an endeavour “only once in life” is not enough; indeed,

⁴⁶ Cf. Hadot, Pierre, *Philosophy as a Way of Life: Spiritual Exercises from Socrates to Foucault*, translation by Michael Chase, Oxford: Basil Blackwell, 1995.

⁴⁷ It is however convenient to recall that Descartes makes manifest of his surprise that “learned and serious people” should not have been persuaded by his reasoning in the *Meditations* (cf. Alquié, Ferdinand (ed.), *o.c.*, volume II (1638-1642), pp. 889-890; cf. *AT*, pp. 243-244).

other traditions of thought demand that they be conducted not just once in a lifetime, but constantly and on a regular basis⁴⁸.

But this demand that we ourselves should undertake the “spiritual exercises” or “meditations” (and careful attention should be paid to the religious connotations of the word used by Descartes), that we should conduct them in the *first person*, if we are to judge over the matters they preside, is not the only thing Descartes proposes. He further advances that we should conduct another type of study in the *third person*; a study in which, and through hypothesis, we should build a theory of knowledge by which we may see how the understanding helps itself with the imagination, the senses, and memory (and perhaps, as we shall soon see, with movement and emotions) “to reach truth in the sciences”. This third person study is precisely the philosophical physiology that constitutes the main theme of this work. But before we move onto it, I should wish to add that this two-faced Cartesian critical endeavour reemerges, if in a more obscure guise, in the Kantian critical endeavour. At first sight, it would seem as if the philosophical effort of tracing the limits of pure reason –both in theory and in practice- and even those of the faculty of judgment (*Urteilkraft*), was something we did only in the third person. But an outstanding feature of the extraordinary interpretation of Kant inaugurated by Jakob Friedrich Fries, and continued by Ernst Friedrich Apelt and in the XXth century by Leonard Nelson⁴⁹, is the insistence that the main part of that critical endeavour must be done in the first person. In fact, I consider that the one mistake this interpretation (which is much more thorough and satisfactory than any of its better known alternatives) incurs is that, in pressing the personal character of the critical effort, it obscures the other component that is central to Kant,

⁴⁸ In the revised texts, Descartes never provides us with an accurate quantifier to tell us if we must engage in it “at least once in life”, “at most once in life” or “exactly once in life”, but it is clear in many contexts that he is proposing that we do it *just* one time in life. In any circumstance, this remains unclear for his personal case, as, on the one hand, he writes the Princess Elisabeth that he commits “a few hours a year” to metaphysical studies, which would appear to imply that he repeated these meditations from time to time; on the other hand, he elsewhere remarks that his meditations did not convince him at first, and that it was only through persisting in them that he eventually succeeded in convincing himself, which may –albeit not necessarily- indicate that they should be performed several times (*cf. ibid.*, pp. 882-883; *cf. ibid.*, pp. 238-239). Certainly, the “spiritual exercises” of the Kantian-Nelsonian tradition, which normally take on the form of Socratic dialogues, involve a regular performance. And even psychoanalysis, which is the closest thing to a “spiritual exercise” that is afforded us by this, our secular world, demands being conducted over and over again.

⁴⁹ Refer, for example, to Nelson, Leonard, “Die kritische Methode und das Verhältnis der Psychologie zur Philosophie: ein Kapitel aus der Methodenlehre”, reprinted in: *Gesammelte Schriften*, Hamburg: Felix Meiner, 1904, vol 1.

namely, the third person investigation of the conditions of possibility for knowledge and for human actions⁵⁰. I hope to set forth this objection in an upcoming work, and thus open the doors to the urgent task of continuing to develop critical philosophy in the sense of a double nature (meditative, on one hand, and psycho-physiological, on another) which appears, with all clarity, in Cartesian thought and which becomes obfuscated in Kant, despite the greater sophistication that the latter reaches in the details, or perhaps, precisely, on account of this⁵¹.

In the sixth Cartesian meditation, which deals with the “existence of material things and the real distinction between the mind and the body”, Descartes conducts a complex reasoning to ensure the existence of bodies in general, his own in particular, and the narrow bond between that body which, by “a special right” he used to term his own before initiating his meditation, and that soul which becomes immediately known to him through it⁵². And it is in this context that he says that “physics” teach him how to explain his movements and the agitations he suffers because of the nervous connections between the different parts of his body and brain⁵³. This passage, which tends to be overlooked whenever the Meditations are discussed, establishes the need (and he justification in the order of reasons) of passing from the meditative part of the Cartesian critical endeavour to its psycho-physical component, given that, even if everything has been disposed of by God in the best possible way so that it “leads to the conservation of the body”, not even he can avoid that “the nature of man, composed of mind

⁵⁰ This error became in part possible thanks to the use of the Word “psychology” by Fries, at a time in which no experimental science in the third person by this name existed. It became further involved through Nelson’s anachronical insistence in continuing to use this term in order to refer to meditations in the first person. Austrian thinker Paul Branton has striven to develop the third person component in the Kantian critical endeavour (cf. Osborne, David, Rene Branton, Fernando Leal, Patricia Shipley and Tom Stewart (eds.), *Person-centred Ergonomics: the Brantonian View of Human Factors*, London: Taylor & Francis, 1993); while the first person component (or better yet, the first and *second person* component), in the guise of the Socratic dialogue that was restored by Nelson, has been developed most especially by Gustav Heckmann (*Das sokratische Gespräch: Erfahrungen in philosophischen Hochschulsminaren*, Hannover: Schroedel, 1981).

⁵¹ Cf. Leal, Fernando, “The Future of the Critical Philosophy”, keynote speech written for the *International Residential Conference on Critical Philosophy*, Sussex, July-August, 1996. It is, in any case, convenient to warn the reader that the nature of what we might term as “Kantian (or “Freisian” or “Nelsonian”) meditations” is broader and more diverse, particularly as pertains to the ethical issues that Descartes pushed –as is well known– into the background of “provisional morality” (refer, for example, to Nelson, Leonard, *Kritik der praktischen Vernunft*, reprinted in: *Gesammelte Schriften*, Hamburg: Felix Meiner, 1917, vol. 4, especially Part III).

⁵² Cf. Alquié, Ferdinand (ed.), *o.c.*, volume II, p. 224; cf. *AT*, pp. 76-77.

⁵³ Cf. *ibid.*, pp. 232-234; cf. *ibid.*, pp. 86-88.

and body, can sometimes be flawed”⁵⁴, so that this last meditative consideration “helps me not just so that I may take note of all the errors to which my nature is exposed, but also so that I may readily amend and avoid them”⁵⁵. Such a task, conceived as purely normative at the time in which Descartes was still writing the *Regulae*, is now also invested with the character of a psycho-physiological investigation, as was posited by the unfinished *Traité de l’homme* and continued well into the *Passions*. In a time in which attempts to “naturalize epistemology” are nothing but abundant, there can be no doubt to the effect that Descartes is our contemporary.

The Mechanicist Theory of the Imagination: The Critical Endeavour in the Traité de l’homme

I view the brain not as a box with compartments that contain sadness, joy, color, texture, and all the other ‘objects’ and categories that one might think of. Instead, I envisage it as a constantly shifting dynamic system; more like the flow of a river in which patterns emerge and disappear, than a static landscape... This is an entirely different image from the brain as a computer with stored contents or sub-routines to be called up by a program. In nature’s pattern-forming systems, contents aren’t contained anywhere but are revealed only by the dynamics.

Kelso

The first thing we should say about the *Traité de l’homme* is not, as might appear to be the case, that it is a treatise proper, in the sense of being an independent work. Rather, it is the second part of a much more ambitious treaty, the title of which is itself overwhelming: *The World*. One must try to imagine a book with such a title: *The World*, that is to say, the totality of things. It truly reminds us of the breadth of the earlier works of our philosophical tradition: the writings of whom we have taken to calling “Presocratics”, all of whom wrote works entitled *περὶ τῆς φύσεως*, *On Nature*⁵⁶. The

⁵⁴ *Ibid.*, p. 234; *ibid.*, p. 88.

⁵⁵ *Ibid.*, p. 235; *ibid.*, pp. 89-90.

⁵⁶ In the case of Parmenides, of course, the writing was apparently entitled *περὶ τοῦ ὄντος*, *On Being*, but even if it were the case that this title announced a radically different problematic to the other writings *On Nature*, its globalizing intent is the same, whether in Parmenides or in Descartes. There is, however, a difference on which Heidegger insists: the world, for Descartes –as for the whole of the Christian tradition– is not merely the totality of entities: it is an entity unto itself, the *ens creatum* faced with its creator, a being before another being. This essential difference is too complex to submit it to analysis here, but I shall return to it briefly at our conclusion.

title of Descartes' projected work, partially written between 1629 (when he was merely 33 years old) and 1633, but never submitted by him to the press (for reasons connected to the Galilean condemnation by the Italian Inquisition) is, indeed, kindred to them, in that it pretends to account for nothing less than everything. The work, such as it was conceived by Descartes, would comprise three treaties: the *Treaty on Light*, the *Treaty on Man*, and the *Treaty on the Soul*. Like a movie camera drawing close to its objective, Descartes starts with a general outline of his physics, that is to say, his theory of the universe, in order to get close to that singular part of the universe that is made up by human beings, so as to finally zoom into the soul or reason of that singular part of human beings. The first two treaties are applications of Cartesian mechanicism, while the third would signal the entrance of dualism, revealing how the soul or reason could not be mechanically explained. Of the first two treaties we have nearly finished versions: only two transitional chapters are missing in the *Treaty on Light* and the *Treaty on Man*, and one or two chapters are needed to round up the exposition of the *Treaty on Man* and make the transition into the *Treaty on the Soul* possible. Of the *Treaty of the Soul*, instead, we do not even have a single line, and even the title I am here bestowing on it is fictional.

The *Treaty on Light* aims to be a fairly thorough outline of physics, as it busies itself with the old scholastic qualities according to the new mechanical philosophy, and also with the elements –the sun and the planets, gravity and the tides- and the phenomenon of light, which will serve as a sort of Ariadne's thread for the whole of the work; we know that in the *Treaty of Man* light shall have a unique role by way of the Cartesian theory of visual perception (of which it can be said to be the most developed part of this treaty); and it would not be farfetched to suppose that it should also play an analogous role in *the Treaty on the Soul*, by virtue of the Cartesian doctrine of the "natural light" of reason. Be as it may, Descartes focuses quite closely on the general laws of movement, and the explanations provided in the *Treaty on Man*, that is to say, in the complete Cartesian physiology, are committed to the mechanistic vision: we shall only hear of matter in motion, especially when it involves pieces of matter (masses) of a variable density which are set into motion by particular forces of variable velocities. Given a force F , the velocity v asserted by F over a given mass m is inversely proportional to the density of m : when subjected to equal forces the rougher masses are moved more slowly and the finer ones more quickly. Conversely, we might also say that if two masses m_1 y m_2 , are such that m_1 is greater than m_2 , and both move at the same velocity v , then the force required to

move m_1 is greater than the one required to move m_2 with velocity v . However, and as we shall see, the forces summoned by Descartes are always constant, which is why it shall be better for us to retain the first of our formulations. What follows is a brief summary of the path that is followed by the masses inside the body:

- To start at the beginning, Descartes' physiology begins with the intake of food, which consists of pieces of mass of a variable density, all of which are more or less rough. Until they reach the stomach, these pieces of food are propelled by the force that is applied on them by the muscles of the mouth. Likewise, the foodstuff found its way to the mouth thanks to the action of the limb muscles that moved it to it. Let us call this force F_m . Where F_m comes from is discussed by Descartes in his later evaluation of muscular motion.
- Once it has reached the stomach, the food is processed by "force of certain liquors which, flowing amongst its parts, separate, stir and warm it". Descartes compares this chemical process to the action of water over quicklime or to the effect of acids (as in the case of the "etching") over metals⁵⁷. Descartes has no qualms in demonstrating that this force is a mechanical one, insofar as it applies velocity to given masses of a variable density. He does, however, add that the aforesaid "liquors" come from the heart. As we shall see further ahead, the heart is conceived by Descartes as being a small, if powerful, furnace, a heat source that is independent from muscular action, constituting a force which –even as he fails to ever explain it in mechanical terms- he imagines in such terms⁵⁸. The heat of the heart is such that the liquors it sends to the stomach are very warm upon arrival, and everything seems to indicate that Descartes believed this heat was the force that thinned the food down, producing two different types of mass, one of which was rougher and grosser than the other. We shall call this force F_c . The rougher masses (those which could not be thinned down enough by the hot liquors of the heart) drop into the intestines, which eventually excrete them. The remaining masses, conveniently thinned down, are then transferred to the

⁵⁷ Cf. Alquié, Ferdinand (ed.), *o.c.*, volume I (1618-1637), pp. 380-381; cf. AT, p. 121.

⁵⁸ Descartes' notions on the mechanical nature of heat may be consulted in Chapter II of the *Traité de la lumière* (*ibid.*, pp. 319-323; *ibid.*, pp. 7-10). As is well known, the problem of physiological heat is related to the appearance of a real mechanic theory of heat, the problems of which would not be solved until the XIXth century (cf. Goodfield, G.J., *El desarrollo de la fisiología científica*, translated by Jorge Brasch, México: UNAM, 1987).

liver. The separation of these two kinds of mass is dictated by the breadth of the tubes which issue from the stomach: the fine particles may pass through the narrow tubes that lead into the liver, whereas the coarser particles, being unable to pass through them, are made to move through the wider tube that connects the stomach with the intestines⁵⁹. In other words, the stomach is simply conceived of as a sieve or a drain. In this way, both types of particles move, presumably, in compliance with the principle of inertia; in other words, they preserve the movement they already bring with themselves and which was applied on them by forces F_m and F_c . Up to this point, then, we have only two forces at work: the muscular one at the mouth, and the heating one of the heart.

- The liver is conceived as a porous organ, another sort of sieve, except that Descartes fails to clearly explain if there is any separation as in the case of the stomach; he merely states that the liver produces a yet greater thinning of the masses hailing from the stomach, turning them into the fluid we know as blood. The inertia of these masses makes them exit through the only conduit found in the liver, one which leads directly to the heart, or –to be more accurate- to the right concavities of it⁶⁰. The heart is, as we said before, a small but potent furnace which heats up masses to render them yet more subtle. By way of this same force (a second manifestation of F_c) they are then transferred through the only available conduit, which takes them to the lungs. These serve essentially as cooling apparatus, which use the air they take in from the exterior world (through the action of other muscles, that is to say, through a second manifestation of F_m which Descartes shall proceed to expound, all in due time) to cool down the fine particles that they receive from the heart. This cooling process once again disperses said particles, obviously without a total loss of their velocity, which is why they are once again transported to the heart –or, more precisely, to its left concavities- where they are used to fuel the fire of that alleged oven⁶¹. Out of one of these, a part of the blood (the coarser one) is sent to the rest of the body. I shall not detail the movements of the heart or the diverse parts of the body to which the blood is sent for lack of space. What matters here is that Descartes does not make any other force different to F_m y F_c intervene at

⁵⁹ Cf. Alquié, Ferdinand (ed.), volume I, p. 381; cf. *AT*, pp. 121-122.

⁶⁰ Cf. *ibid.*, pp. 381-382; cf. *ibid.*, pp. 122-123.

⁶¹ Cf. *ibid.*, pp. 382-383; cf. *ibid.*, pp. 123-124.

any point. It is important to underscore that the finer particles –which are destined to the heating of the heart- have a greater velocity (for the mechanical reasons explained) and this is what makes them move through the straighter path towards the brain. Once again, the heart works like a sieve.

- These maximally slender masses (of minimal materiality, which occupy minimal portions of space) of maximal velocity are subjected to the final process of sieving in the brain itself: only the finest particles can pass through the narrow tubes of the brain, the thinnest of which would be those leading to the pineal gland. This mechanical process is quite complex, as it also involves the participation of the blood, formed, as it is, by coarser particles which, upon “losing much of their agitation” come to help the finer particles on their way, “transferring part of their force to them”⁶². Be as it may, such particles –the finest and thinnest of them all, and those that travel at the highest speed- are the so called “animal spirits”, which was the expression of the time. The term “spirit” refers to the nearly immaterial nature of these masses. Such “spirits” constitute the fluid that the brain will send to the muscles of the body (including, as is meet, those which allow for the ingestion of food and respiration) to allow for it to move. With this we shall see that a significant reduction takes place, insofar as F_m turns out to be a mere manifestation of F_c , so that the mechanics of the human body depend on the single calorific strength of the heart.

The movement of that superfine fluid that comprises the “animal spirits” is possible because of the enormous force applied to it by the heat of the heart; the transportation of such masses takes place at a very great speed through the nerves, which Descartes –like every other anatomist of his time- conceived as (hollow) tubes just like the veins and arteries of the circulatory system. In other words, the human body counts with two circulatory systems: one which transports the relatively thick fluid of blood through the veins and arteries, and another which transports the extraordinarily thin fluid of the “animal spirits” through the hollow nerves, with both movements being caused by the single calorific action of the heart.

The most outstanding and primordial movement of the “animal spirits” for Descartes is that which makes the muscles move, conceived as bellows that inflate or deflate depending on whether the “animal spirits” are on their way in or out”⁶³. Some of these muscles control the movements of

⁶² *Ibid.*, pp. 386-389; *ibid.*, pp. 128-129.

⁶³ *Cf. ibid.*, pp. 389-403; *cf. ibid.*, pp. 130-141.

the body, that is to say, its movements in space (including the introduction of food into the mouth); others control internal movements, especially deglutition, respiration and ocular movements (as well as yawning, sneezing, coughing or excretion). For each of these explanations, we are met with a active mechanism that is far more realistic than that of most contemporary mechanistic's, whose models of men do not appear to eat, breathe or move (in the best of cases they are allowed to see, and even when it comes to visual perception, they do not seem to do so with eyes such as those described by Descartes: rather, they are manned by muscles in different ways)⁶⁴. In this sense, the Cartesian mechanicism seems to me to be the philosophicaly superior one by far, even when its anatomical and physiological details have been surpassed by later biological and medical research.

For want of space, I shall not stop in the profuse and complex mechanical explanation that Descartes affords us of visual perception, nor on the simpler and curter details of the perception of the other organs of the senses, of the emotions and feelings. On the other hand, I should like to say something about his mechanical explanation of the imagination and memory, as these are faculties which, together with the senses, aid the understanding in its "search for truth". With Descartes considering the extreme minuteness of the nervous conduits, he reasons that even the smallest stimulation of the sense organs stirs up mechanical stretches and tensions leading to the brain and, ultimately, to that great recipient of animal spirits filtered from the blood: the famous gland H of the *Treaty on Man*, the pineal gland. But it is important to distinguish between the "figures" that are printed in the back of the eyes from those which are "traced on the spirits on the surface" of the pineal gland, "where the seat of the imagination and the common sense" are found. It is only these last "figures" that deserve the designation of "ideas" (let us recall that, in the *Regulae*, Descartes used both terms as synonyms). Such ideas, forms or images are those which the

⁶⁴ A remarkable –indeed, almost grotesque– case of this is found in Patricia Churchland, who thanks Larry Jordan –in her doubtlessly very important first book– for having taught her neurophysiology and laboratory techniques, but above all for "convincing me that it is essential to think how organisms *move*" (Churchland, Patricia, *Neurophilosophy: Toward a Unified Science of the Mind/Brain*, Cambridge, Mass.: MIT Press, 1986, p. x). And I call it grotesque because the human organism that is described in her book does not appear to move a great deal. In her most recent work, and even as we must admit that it contains a chapter dedicated to "sensomotor integration", the latter comprises a small fragment of the book, appearing towards the end and failing to consider many movements (cf. Churchland, Patricia and Terence Sejnowski, o.c., capítulo 6).

“rational soul shall consider immediately when, being bound to this machine, it comes to imagine or feel some object”⁶⁵.

Come this point, Descartes must insist on the “imagine or feel”, because the rational soul not only concerns itself with the images mechanically formed from the sense organs, but also with those produced by the imagination⁶⁶. In fact, when the “animal spirits”, upon having received the impression of some idea in the pineal gland, exit it, they pass through certain tubes of the brain, broadening them in different (always small) proportions, in such a way that they leave a more or less permanent disposition in said tubes (depending on the time of their passage through them) to widen again in the future. Such a disposition constitutes the corporeal memory of which Descartes had already spoken in the *Regulae*⁶⁷. This “disposition” is illustrated by Descartes through the example of a cloth in which we introduce a slender needle: the hole we have made will close, but the cloth becomes less hardy at that point, and will open easily in the future at that very spot⁶⁸. It is stunning to observe how with this brilliant idea Descartes came to anticipate the speculative doctrine of Donald Hebb⁶⁹ which served as a basis for all the current efforts to study memory. Indeed, the most recent proposals to apply non-linear dynamic systems to the study of mental operations remind us yet more clearly of this notion of a disposition in the nervous tissue that would facilitate eventual actions⁷⁰. Be as it may, Descartes completes his mechanical explanation of the imagination and memory by presenting us with his theory of what would later be known as “association” by the English empirical philosophers; namely, that by opening just

⁶⁵ Alquié, Ferdinand (ed.), *o.c.*, volume I, p. 450; *AT*, pp. 176-177

⁶⁶ Come this point, Descartes refers to “the prints of ideas” which pass “through the arteries towards the heart and irradiate in all the blood”, as well as to the relation between this and what happens in the mother’s womb. This would be of great interest considering the innate nature of ideas, but Descartes does not develop it here. However, his mention of blood in this context leads us to think that the circulatory system cooperates with that other circulatory system of the “animal spirits”, which might be an anticipation of the modern biomedical version where, for example, the hormones travel through the bloodstream, conforming a slower –albeit equally important –pathway for the the electrochemical relay of the nervous system- communications system. That said, contemporary mechanists never speak of blood, even if, in my opinion, it remains a very promising philosophical topic.

⁶⁷ *Cf. ibid.*, pp. 451-452; *cf. ibid.*, pp. 177-178.

⁶⁸ *Cf. ibid.*, pp. 452-453; *cf. ibid.*, p. 178.

⁶⁹ *Cf. Hebb, Donald O., Organization of Behavior: a Neuropsychological Theory*, New York: Wiley, 1949.

⁷⁰ *Cf. Thelen, Esther and Linda B. Smith, A Dynamic Systems Approach to the Development of Cognition and Action*, Cambridge, Mass.: MIT Press, 1994; *cf. Kelso, J.A. Scott, Dynamic Patterns: the Self Organization of Brain and Behavior*, Cambridge, Mass.: MIT Press, 1995, see subhead.

a few of these holes, this would “cause others to open”, especially if they had widened together to begin with⁷¹. This is how, upon seeing a nose, I almost immediately visualize the entire face, because I am not accustomed to seeing it alone. We can thus say that the mechanism is complete before our eyes, even as Descartes happens to know full well that only further investigation in the direction so masterly outlined in the *Treaty on Man* could afford us with more details on the matter. And this is exactly what has happened, albeit not –regrettably-- at the hands of philosophers, but at those of doctors and biologists, whose heroic work has yet to be rewarded with the attention it deserves on philosophy’s behalf.

With this I should be bringing my brief considerations on the philosophical physiology of Descartes to a close, if I did not think that it might be worth speculating about the interesting fact that Descartes seems to have been satisfied only with his mechanistic theory of visual perception, which he presented time and time again in other works. Did he think his mechanistic theory of the imagination and the memory required further development, to be featured in his *Description du corps humain*? Yet more importantly: did he write his *Passions de l’âme* because he came to believe that without a consideration of the effect of the passions on the operations of the understanding, the critical task inaugurated with the *Regulae* would be incomplete? This must be left to a future reading of the last works of Descartes, but it is interesting to probe that, if this were the case, then Descartes anticipated even his most recent critics, who accuse him of an anti-emotional intellectualism which does not allow us to see that reason cannot exist without the emotions and that these –together with the imagination, memory and the senses– are indispensable aids to the understanding, to such an extent that the loss of the emotional faculties brings with it a fundamental loss in the ability to think⁷². I must now focus on recalling two important facts which seem to acknowledge that the passions would, in principle, be not just an impediment but also and eventually an aid to the understanding. The first is that Descartes considers the passions as a kind of “imagination” or “perception”⁷³; the second, that our author explicitly

⁷¹ Descartes’ theory has been recently criticized as not being truly mechanistic; because the “patterns” formed do not correspond to the level of the impacts (the law “mass x velocity”) and of “simple machines” (cf. Grosholz, Emily R., *Cartesian Method and the Problem of Reduction*, Oxford: Clarendon Press, 1991). As serious as this critique is, it cannot be discussed here.

⁷² Cf. Damasio, Antonio R., *Descartes’ Error: Emotion, Reason, and the Human Brain*, New York: Putnam, 1994.

⁷³ Cf. Alquié, Ferdinand (ed.), o.c., volume III, pp. 967-975; cf. AT, pp. 343-350 (articles 19-29 of the *Passions of the Soul*).

declares that “all the passions are good by nature” and that “all the good and evil in our lives depends on them”⁷⁴. The critical endeavour of the future must, because of this, consider the study of the imagination, the senses, memory, the emotions and action, together with their cooperation with the understanding, in order to attain knowledge⁷⁵.

That There Is Only One God in the Original Design: By the Manner of a Conclusion

Eo me fateor natum esse ingenio, ut summam studiorum voluptatem non in audiendis aliorum rationibus, sed in iisdem propria industria inveniendis semper puerim; quod me unum cum juvenem adhuc ad scientias addiscendas allexisset, quoties novum inventum aliquis liber pollicebatur in titulo, antequam ulterius legerem, experiebar utrum forte aliquid simile per ingentam quandam sagacitatem assequeretur, cavebamque exacte, ne mihi hanc oblectationem innocuam festina lectio praeiperet. Quod toties successit, ut tandem animadverterim, me non amplius, ut caeteri solent, per vagas et caecas disquisitiones, fortunae auxilio potius quam artis, ad rerum veritatem pervenire, sed certas regulas, quae ad hoc non parum juvant, longa experientia percepisse.

Descartes, *Regulae*, X, 1; AT, p. 403

The most famous combination of dualism and mechanicism to be featured in the writings of Descartes is doubtlessly that which opposes a rational, intelligent and thinking soul (*res cogitans*) to an extended, moveable, sentient and imaginative body (*res extensa*): said opposition is constitutive of his philosophical physiology, which is practically complete –and even detailed– in the *Regulae ad directionem ingenii*. However, but a few years later, in *Le monde*, Descartes sets out the lineaments for this primordial opposition, to which he adds a new one, namely, that which counters a creating God to a created world: “Je considère qu’il y a une infinité de divers mouvements qui durent perpétuellement dans le Monde... Je ne m’arrête pas à chercher la cause de leurs mouvements, car il me suffit de penser qu’elles ont commencé à se mouvoir aussitôt que le Monde a commencé d’être. Et, cela étant, je trouve par mes raisons qu’il est impossible que leurs mouvements cessent jamais, ni même qu’ils changent autrement que

⁷⁴ *Ibid.*, pp. 1100-1103; *ibid.*, pp. 485-488 (articles 211-212 of the *Passions of the Soul*).

⁷⁵ Cf. Thelen, Esther and Linda B. Smith, *o.c.*, Chapter 11 especially, for a sample of what this future enterprise could be.

de sujet. C'est-à-dire que la vertu ou la puissance de se mouvoir soi-même, qui se rencontre dans un corps, peut bien passer toute ou partie dans un autre et ainsi n'être plus dans le premier, mais qu'elle ne peut pas n'être plus du tout dans le Monde. Mes raisons, dis-je, me satisfont assez là-dessus; mais je n'ai pas encore occasion de vous les dire. Et cependant vous pouvez imaginer, si bon vous semble, ainsi que font la plupart des Doctes, qu'il y a *quelque premier mobile* qui roulant autour du Monde avec une vitesse incompréhensible est l'origine et la source de tous les autres mouvements qui s'y rencontrent⁷⁶ [Note from the translator : «I consider that there is an infinity of diverse motions that endure perpetually in the world...I do not stop to seek the cause of their motion, for it is enough for me to think that they began to move as soon as the world began to exist. And that being the case, I find by my reasoning that it is impossible that their motions should ever cease or even that those motions should change in any way other than with regard to the subject in which they are present. That is to say, the virtue or power in a body to move itself can well pass wholly or partially to another body and thus no longer be in the first; but it cannot no longer exist in the world. My arguments, I say, are enough to satisfy me above, but I have not yet had occasion to relate them to you. In the meantime, you can imagine if you choose, as do most of the learned, that there is some prime mover which, rolling about the world at an incomprehensible speed, is the origin and source of all the other motions found therein»].

This God, that is so cautiously introduced here, will be confirmed as the prime mover and author of the three laws of movement later⁷⁷, in the frame of the fiction of a new world⁷⁸. We might say, then, that in a first instance, the Cartesian dualism-mechanicism is physiological and psychophysiological; that in a second instance, it is physical and cosmological; and that, even if, in principle, the one partakes of the other (as the rational soul is also, and itself, a creature), in practice they function in parallel: God creates the world and sets it into motion, the rational soul acts in the world, that is to say, it moves in it and moves the things in it. In a recent conference, Laura Benítez invited us to reflect on the fact that the physico-cosmological dualism has a second and compelling parallel: that which opposes an infinitely good and wise God (undeceiving as he is undeceived) to a rational soul that is capable of knowledge. The parallel is all the more

⁷⁶ Alquié, Ferdinand (ed.), *o.c.*, volume I, pp. 324-325; AT, p. 11 (Chapter III of the *Traité de la lumière*); emphasis has been added to the original.

⁷⁷ Cf. *ibid.*, chapter VII.

⁷⁸ Cf. *ibid.*, chapter VI.

interesting –the author tells us– in that the world is a moveable plenum in which the movement started by God cannot be stopped, in *a similar way* to how the rational soul receives the clear and distinct ideas that are capable of achieving an “intellectual plenum” (the phrase is Laura Benitez’s) from God, in the form of the true philosophical system that Descartes strives to create: a plenum in which knowledge itself cannot cease, but in which it will progressively increase, for as long as we know how to curb our will and not settle for anything but the appropriate concatenation of clear and distinct ideas. A mechanical God (in the sense of the *nomen agentis*, that is, not *un Dieu mécanique* but, rather, *un Dieu mécanicien*) initiates the perpetual movement of the world and an epistemologist God initiates perpetual knowledge in the rational soul. Laura Benitez’s suggestion is not just a fascinating one: to some degree, it establishes a link between the cosmological dualism-mechanicism and the physiological one. This is why I believe that this suggestion demands further exploration, and I should only like to make three warnings so that it might not falsify history.

The first is perhaps the most obvious and important one. The epistemological dualism that makes its first appearance in the *Discours* is emphatically *not* a case of combining dualism with mechanicism: both substances which come into opposition here –God and the rational soul– are both examples of *res cogitans*. In this sense, there is, strictly speaking, no metaphysical or ontological dualism in this new development, and this is why the epistemological dualism seems to me to be not just new, but also, and to some extent, alien to original Cartesian thought.

Which in turn leads us to our second observation: the epistemological dualism which appears in the *Discours* is a late development in Descartes’ thinking. It is quite clear that the French philosopher does not initiate his career as an epistemologist, but rather –and strictly– as a *working mathematician*, or better yet, as a *géomètre* (in the double sense of a mathematician and physicist that the French expression would convey for a long time, before and after Descartes’ time) preoccupied with concrete problems. But from that very moment onwards, his mind begins to generate a system that is both consistent and complete (a sort of “intellectual plenum”, to repeat Laura Benitez’s brilliant phrase). What matters here is keeping in mind that this systematizing tendency does not mean to say that Descartes already had epistemological concerns (what we, today, would call –more accurately and anachronically at once– a philosopher of science); that is to say, that he believed or thought that science (*la géométrie*) should be a consistent and complete system. It is much more plausible to think *that his mind worked*

that way. There are, I think, different types of intellect, and one of them (which we shall term “synthetic intellect”), operates “all of a sudden”, as it were, spanning large areas of “mental space” and establishing connections between multiple figments of information. Descartes was, to some extent, aware of the way his mind worked, as is witnessed by the passage of the *Regulae* in which he declares that it is sufficient for him to read the first pages of a book on geometry to imagine the rest (see subhead); and if my memory does not fail me, there are other fragments of his juvenilia that pinpoint in the same direction⁷⁹.

We reach our third consideration: the appearance of epistemological dualism. At the precise moment in which it does show up (in the *Discours*), it is probably not a necessary –nay, *not even a predictable*– development in Descartes’ thinking. The best way to underline this is by noting the enormous gap that separates endeavours such as the *Regulae* and *Le monde* from texts such as the *Discours*⁸⁰. The first of these works, even if unfinished, bears the unmistakable seal of an *ars* in the classical sense, being a prescriptive and normative work; it is nothing like epistemology in the modern sense, that is, a theoretical treatise on the foundations of knowledge, but rather a practical treatise *de ratione intelligendi vel cogitandi*. And even if the project was thwarted, there are sufficient indications in the fragment we possess of it to be sure of the (almost “Ancient”) nature of the work. As for *Le monde*, this same frustrated nature might stir up a doubt that is harder to quell. Indeed, and having once applied his mind to the construction of a

⁷⁹ These are key texts for the understanding of Descartes, at least in my opinion, which is based, like the previous idea on the “synthetic intellect”, on my own intellectual experience (even if my mind most probably has not a millionth Descartes’ caliber, it works similarly). Let us thus say briefly that Descartes’ mind was an intellectual plenum and that his theoretical constructions tended to be intellectual plena. This is not equivalent to saying that Descartes’ possessed an epistemology; just like a carpenter knows how to do many things (and even has a peculiar way of going about it) without having an epistemology of that knowledge. And it would be abusive, in each case, to say that Descartes or that the carpenter have an “implicit” epistemology. However, the products they both create have a certain structure and to some extent embody that form or style of working. The original antipathy that Descartes felt for Galileo was an antipathy pertaining to intellectual temperaments, quite like that we witnessed, almost three centuries later, between Cantor and Kronecker. (And in many other cases, it does not quite reach antipathy but just a difference in style, as was the case amongst such intuitive mathematicians as Poincaré and Thom, and deductive mathematicians like von Neumann, or more generally between geometers and analytics). It was not, thus, an antipathy based on a prior epistemological conception, even if such a conception came to find expression later, in terms such as “he does not build theory as it should be” (a critique that’s not exclusive to Descartes and which many a researcher has made to another, as in the case of Russell when referring to the later Wittgenstein, to some extent).

⁸⁰ Cf. Gäbe, Lüder, o.c.

physics (which requires divine perfection) and a physiology (which necessitates a soul), Descartes now planned to explain his conception of the soul. But there is nothing to indicate that this conception of the soul should have taken the form of an epistemology. We can certainly not extrapolate from the epistemology that he begins to draw out in the *Discours* –acquiring solidity, for better and for worse, in the *Meditations*, to achieve the preeminent niche it comes to occupy in the *Principia*– to the project of the *Traité de l'âme* which would bring this sort of trilogy that was *Le monde* to a close. There is no trace of this epistemology in what Descartes had written until then, and even as we do not know it for a fact, it seems unlikely that it was about to reach concretion in the *Traité de l'âme*. I am prone to thinking that this treatise was to be a metaphysical speculation more appropriate to the *Regulae*, that is, a speculation destined to describe the peculiarities of the human mind, and most especially of reason. But, it could be said, if it does not necessarily follow the thread of Cartesian thinking, then why did this particular development take place? After all, this is what is usually deemed to be characteristic of Descartes, and foundational of modern philosophy. The explanation is quite probably historical, and related to a publicity hazard. According to Gaukroger⁸¹, the epistemological endeavour (Descartes' legacy to the thinking we consider “modern”) is a *post hoc* one, conceived by Descartes in reply to Galileo's condemnation by the Inquisition. And certainly, one of Gaukroger's most compelling arguments is the philological one, which refers to the radical change in terminologies which can be found in the *Discours* and yet more thoroughly in the *Meditations*.

But then, what would have been the contents of the *Traité de l'âme*? The clues left by Descartes in the *Regulae*, coupled with the terse text of his first two letters to Elisabeth allow us, I believe, to speculate it would have contained a metaphysical theory of the connections between the sense, the imagination and the intellect (or mind, depending on whether we prefer the Latin or the French term), with the purpose of establishing what was most profoundly peculiar to it. The sense and the imagination (including memory) have a purely physical –that is to say, mechanical- explanation that is in agreement with the three principles of movement advanced in the *Traité de la lumière*, but the operations of the intellect by far surpass, Descartes believes, this kind of explanation. Even as it has become habitual to pitch Hobbes against Descartes, I am of the opinion that the French philosopher could very well have accepted his British counterpart's description of intel-

⁸¹ Cf. Gaukroger, Stephen, *Descartes: an Intellectual Autobiography*, Oxford: Clarendon Press, 1995.

lectual operations such as *reckoning*, but I also think that he would never have accepted that this reckoning was a corporeal operation; in fact, he likely would have challenged Hobbes to give a mechanical explanation of it, which he would have been unable to do for want of Descartes' anatomical expertise, among other things. It has been only in recent years (and due in great part to artificial intelligence) that we have been able to imagine a mechanism capable of reckoning, and in this Hobbesian sense (even as I insist it could be termed Cartesian, just the same) a mechanism capable of thought: a rational machine.⁸² Faced with artificial intelligence, Descartes would probably have questioned his peculiar dualism-mechanicism and strived to find the structures and processes (the movements) capable of performing these calculations at the anatomical level⁸³.

In brief: Cartesian physics, for which the world is *machina ex Deo*, requires a God, but not an epistemological one –such as the one that appears for the first time in the *Discours*– but *mécanicien*. Likewise, the Cartesian physiology demands a rational soul, but not a soul that doubts mechanically, but a soul that proceeds according to the precepts established by the *Regulae* (that is, a soul which reckons and which reckons well, serving itself

⁸² The main difficulty here is that internal (or corporeal) manipulations be “semantically coherent”, that is, that they preserve the truth through the transformations of the symbols and representations. A mathematical demonstration of the possibility of this preservation and coherence was given in our century by the mathematician Alan Turing, and it is the basis for artificial intelligence specifically, and for the cognitive sciences generally. For a philosophical discussion which, for this same reason, finds Turing to be the second most important thinker –after Descartes– for the exploration of the mind, refer to the works of Jerry Fodor (he himself has collected them in his recent contribution to Guttenplan, Samuel (ed.), *A Companion to the Philosophy of Mind*, Oxford: Basil Blackwell, 1994).

⁸³ Which was, in any case, what the first enthusiasts of artificial intelligence –Descartes' heirs– actually did. There is, however, something of a mystery here. It is known that Pascal was the first to invent a calculating machine and that Descartes came to know of it in 1647 (cf. Lafuma, Louis (ed.), *Œuvres complètes de Pascal*, Paris: Seuil, 1963, p. 187). Even if he had (and with good reason) opposed whoever said that this *machine d'arithmétique* thought, the notion of it was certainly quite more conceivable now that the calculations seemed to have a more corporeal basis. As a matter of fact, I suspect that the system of harmony preestablished by Leibniz (who also devised a calculating artifact) can be seen as a version of the Cartesian dualism that took these new possibilities into account. In any case, we cannot know, for fact, what effect Pascal's machine might have had on Descartes, as he did not write anything on the relationship between thought, in the strict sense of the term, and bodily physiology, after 1647. On the other hand, the irony in the fact that the forte of the actual machines is calculation (the unequivocally intellectual province of Cartesian thought) might be worth noting, especially if we consider that their weak point tends to fall precisely on the side of the senses and the imagination, that is, on what to Descartes was clearly mechanical. (And when I refer to “failure” I mean to say they “fail for now”, even as recent advances within the connexionist investigation appear to be promising [cf. Churchland, Paul, o.c.]

of the senses, the imagination and the memory to do so). Because of this, and even if the parallel insinuated by Laura Benítez is completely enthralling and requires, as I said, more thorough exploration, it is not a case of systematic precedent at the time of the writing of *Le monde*: in fact, it would quite probably not have occurred had it not been for Galileo's condemnation. Descartes, who not only does not ask for trouble but who, like any good Catholic, believes sincerely in the authority of the Church, decides to change his project and it is then that he comes to require a God who serves as a warrantor of clear and distinct ideas, and with it, of Cartesian physics as a whole, physiology included. We shall now pass from the dual structure of *Le monde* (God the mover vs. the world that is moved, the rational soul vs. the sentient and imaginative body) to the triple structure of the *Discours* (the epistemological God vs. the rational soul, God the mover vs. the world that is moved, the rational soul vs. the sentient and imaginative body). And it is only the intellectualist prejudice that leads us to suppose an (implicit) epistemology in the projects prior to the *Regulae* and *Le monde* which might lead us to believe that all was preordained, as it were.

(Translated from Spanish by Monica Belevan)