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## Material translations in the Cartesian brain

Nima Bassiri

Center for the Humanities, Wesleyan University, 95 Pearl Street, Middletown, CT 06459, USA

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### ABSTRACT

This article reexamines the controversial doctrine of the pineal gland in Cartesian psychophysiology. It argues initially that Descartes' combined metaphysics and natural philosophy yield a distinctly human subject who is rational, willful, but also a living and embodied being in the world, formed in the union and through the dynamics of the interaction between the soul and the body. However, Descartes only identified one site at which this union was staged: the brain, and more precisely, the pineal gland, the small bulb of nervous tissue at the brain's center. The pineal gland was charged with the incredible task of ensuring the interactive mutuality between the soul and body, while also maintaining the necessary ontological incommensurability between them. This article reconsiders the theoretical obligations placed on the pineal gland as the site of the soul-body union, and looks at how the gland was consequently forced to adopt a very precarious ontological status. The article ultimately questions how successfully the Cartesian human could be localized in the pineal gland, while briefly considering the broader historical consequences of the ensuing equivalence of the self and brain.

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### 1. Introduction: The soul-body union and the Cartesian brain<sup>1</sup>

In a remarkable 1643 letter to Princess Elizabeth, René Descartes elaborated on the nature of the union of the soul and the body. He expounded on the apparent virtues of “the ordinary course of life and conversation” over intellectual mediation, to which he surprisingly confessed he never devoted any more time than “a few hours a year” (AT III, p. 693; CSMK, p. 227). It was, according to Descartes, only through such everyday experience that the union of the soul and the body could ever be conceived, insofar as such a union could not be *thought* metaphysically by the intellect but could only be experienced as a feeling. Descartes explained, “Everyone feels that he is a single person [*une seule personne*] with both body and thought so related by nature that the

thought can move the body and feel the things which happen to it” (28 June, 1643; AT III, p. 694; CSMK, p. 228).

It might seem surprising that Descartes would advocate for the everyday experience of feeling oneself as “a single person,” since Cartesianism is typically defined as the identification of the self with an immortal, rational soul; it is, as he writes in the *Discourse on Method*, through “the soul by which I am what I am” (AT VI, p. 33; CSM I, p. 127). But it is also important to consider how little the soul was involved in particularizing or differentiating one “I” from another. While it possessed a set of faculties unavailable to any corporeal or material entity, including pure intellection, volition, and the capacity for novel intuitions,<sup>2</sup> many important and what we could call distinctly human mental traits were a consequence of the body's role in the soul-body union, including perception,

E-mail address: [nbassiri@gmail.edu](mailto:nbassiri@gmail.edu)

<sup>1</sup> All references are to the standard Franco-Latin and English editions of Descartes' complete works: Adam and Tannery (1974–1982), hereafter cited as AT; Cottingham et al. (1985), hereafter cited as CSM I & II; and Cottingham et al. (1991), hereafter cited as CSMK. Full English translations of Descartes' *The World* and *Treatise on Man* come from Descartes (1998), hereafter cited as WW.

<sup>2</sup> In a letter to Arnauld, Descartes explains, “Now for the mind to recognize [repetition or recurrence], I think that when these traces were first made it must have made use of *pure intellect* to notice that the things which was then presented to it was *new and had not been presented before; for there cannot be any corporeal trace of this novelty*” (AT V, p. 220; CSMK, p. 356, emphasis added).

imagination, and memory. A soul without a body would lose the ability to remember who it was;<sup>3</sup> it could no longer be receptive to the world around it, or productive of new combinations of sensory images. Its activities would be restricted to the willed though infinitely repeated act—being unable to remember the repetition—of producing the only ideas to which the soul alone had access: namely, the idea of God and of its own existence.

It was, then, the union of the body and the soul that comprised what we might call a Cartesian *human* person. This is neither to diminish the importance of the soul as an object of inquiry and concern in the history of Western philosophy nor to sideline the question of how the soul's ontological certainty was deduced, grounded, and abbreviated in the metaphysical formulation of the *Cogito*. It is only to point out that Descartes was not necessarily, or at least not only, constructing an idealized (rational and immaterial) modern-philosophical subject position as much as he was also attempting to demarcate a physically and mentally composed category identified in the *Meditations on First Philosophy* as the mind-body “union” [*unione*] (AT VII, p. 81; CSM II, p. 56).<sup>4</sup>

He was doing so according both to a set of metaphysical presuppositions and also according to the intricacies of the body's corporeal complexities—a challenge not easily reducible to a simple conception of philosophical mechanism. Some scholars (Bitbol-Hespériès, 2000; Hoffman, 1986) have suggested that the “human” was itself a distinct analytical concept for Descartes, prompted by the notable reference near the end of the *Meditations* to “my whole self [*me totum*] insofar as I am a combination of body and mind [*corpore et mente sum compositus*]” (AT VII, p. 81; CSM II, p. 56).<sup>5</sup> The claim is that a strictly dualistic perspective would be inadequate to describe Descartes' human person as it would emerge from the substantial union of soul and body. Others (Alanen, 1996; Cottingham, 2006; Garber, 2000, pp. 154–55) have even proposed an ontological “trialism,” suggesting that if the *union* of soul and body were not in and of itself a substance entirely distinct from mind or matter, then at least the union would be an irreducible property that demanded an independent analysis (cf. Voss, 1994).<sup>6</sup>

I will for now bracket the ontological question regarding the human person, which I will return to in the conclusion of this paper, and suggest only that identifying the category of the human person in Descartes' natural philosophy and metaphysics requires isolating a material-immaterial amalgam, circumscribed according to the ontological and epistemological finitude of the *Meditations* (“I am, as it were, something intermediate between God and nothingness, or between supreme being and non-being” [AT VII, p. 54; CSM II, p. 38]),<sup>7</sup> but whose functionality was delineated in psycho-physiological terms. It is, to say the least, important to differentiate the

Cartesian soul, and even the ontological-epistemological expression of the *Cogito*, from a third conception of a living, human person—neither strictly metaphysical, nor simply corporeal—who would be summed up by the union of the soul and body.

What is, however, central to consider is that the only details pertaining to the specific nature of that union are to be found in Descartes' theoretical physiology, since Descartes only ever mentioned one very specific site in which the union was effectively staged—that “certain part of the body,” as he writes in *The Passions of the Soul*, “where [the soul] exercises its functions more particularly than in all the others” (AT XI, p. 352; CSM I, p. 340). I refer, of course, to the pineal gland, the little cone-shaped bulb of nervous tissue (thus the Latin, *conarium*), no bigger than a pea and tucked away in what was for Descartes the effective center of the brain. But the fact that the pineal gland was what Aucante (2006, p. 359) calls the “privileged place of the union [*lieu privilégié de l'union*]” actually introduces a conceptual challenge, since this would mean that the pineal would need to facilitate, as no other object could, the operational commensurability between Descartes' two ontologically incommensurate domains and to constitute the site of an absolutely metaphysical encounter too expansive to be satisfied or delimited by mind or matter alone. This paper, then, will consider how the pineal gland could possibly constitute the site of the soul-body union, keeping in mind that the pineal doctrine not only remains an ambiguous vanishing point in Descartes' thinking, but that it exposes some of the most profound difficulties not only of his dualism but conversely, as I will propose, of his account of the soul-body union itself.

But, as we proceed, it will be necessary to consider seriously not only Descartes' pineal doctrine but his theoretical physiology more broadly, and to take our cue from scholars such as Sutton (2000), who aptly counter critical interpretations that view Descartes' natural philosophy as nothing more than a mechanistic de-animation and vulgarization of the body and nature (as Sutton (2000, p. 713) has argued, the Cartesian body was not only quite holistic, but it even exhibited an “uncontrollable plasticity”). Natural philosophy played a central role in Descartes' thinking throughout his life, and the depiction of Descartes as a strict metaphysician is itself something of an historical construction (Gaukroger, 1995, pp. 1–14). To whatever extent that natural philosophy was supplanted by a turn in 1629 to metaphysical pursuits, as Marion (1992) points out, the metaphysics of the *Meditations* was not intended to negate or occlude either the *mathesis universalis* or Descartes' more general method,<sup>8</sup> but was instead provided in part as a means by which to ground (or “root”<sup>9</sup>) Cartesian natural philosophy more rigorously and to ascribe to it a metaphysical force it could not have

<sup>3</sup> Descartes did allude in several places to an intellectual memory possessed by the soul alone (see, for example, his letter to Mersenne, 1 April 1640; AT III, p. 48; CSMK, 146). Sutton (1998, pp. 67–73) describes intellectual memory as essentially a mode of the preservation of and access to abstract and innate ideas, rather than corporeal memory in the strict sense. We might say that intellectual memory enables the soul to preserve the knowledge of *what* it is, but does not enable the soul to remember who it was.

<sup>4</sup> Aucante (2006, pp. 30–39) argues that Descartes imagined the union in three distinct ways, the last of which was what he outlined in his 1643 letter to Elizabeth. I will, for the sake of focusing on a discussion of the pineal gland, centrally assume the description Descartes provides in the letter throughout this paper.

<sup>5</sup> Hoffman (1986) argues that for Descartes the human is a being in itself, an individuated whole or unity greater than just the combination of soul and body. Bitbol-Hespériès (2000, pp. 368–373) suggests that Descartes was engaged in a new philosophical anthropology. Also, Shapin (2000, 147–48) has suggested that Descartes' psychosomatic medicine exhibited properties that cannot be reduced to a philosophical dualism.

<sup>6</sup> Voss (1994, p. 278) argues instead that for Descartes, the union of the body and soul is the state of being joined, not the emergent product. Voss argues that the ontological category of the human was impossible after 1643. I will return to Voss's argument in the conclusion of this paper.

<sup>7</sup> Descartes is even clearer about finitude in the *Principles of Philosophy*, when he writes that “we must take the precaution of always bearing in mind . . . that we are altogether finite” (paragraph 24, AT VIII, p. 14; CSM I, p. 201).

<sup>8</sup> Descartes' conception of method in the *Discourse of Method* is understood as an extension of the major premises of his *Rules for the Direction of the Mind*. For the significance of method in early modern philosophy, especially as it relates to Descartes, see Gaukroger (1995, pp. 111–15). Generally, the notion of method is the reduction of a proposition to simpler assumptions, leading finally to an initial, self-evident intuition, on which, deductively, new propositions can be built. *Mathesis universalis*, on the other hand is concerned specifically with order and the science of ordering. See for example Schuster (1980). The two concepts were linked but not absolutely identical in the *Rules*. See Garber (2000) for more on the differences.

<sup>9</sup> As Descartes writes in the preface to the *Principles of Philosophy*, “Thus the whole of philosophy is like a tree. The roots are metaphysics, the trunk is physics, and the branches emerging from the trunk are all the other sciences, which may be reduced to three principal ones, namely medicine, mechanics, and morals” (AT IXB, p. 14; CSM I, p. 186).

previously possessed.<sup>10</sup> As Descartes' physics and physiology continued to develop throughout the 1630s and 40s, they in turn shaped significant premises of his philosophy (Hatfield, 1992).

From this point of view, Descartes' theoretical physiology is not a simple supplement to his philosophical writings, in the same way that the metaphysics alone do not fully elaborate the precise parameters of a rational, willful, living, and fully embodied human person in the world.

The metaphysics in general and the dualism in particular comprise only the antecedent conditions delimiting the ontological possibility of the human as both mind and extended matter. While the dualism is requisite for the description of the human person, it is not the description itself. It is necessary instead to look at the details of the union of the soul and the body, not as a reiteration of the dualism but as an account of a complex economy taking place across the Cartesian ontological divide, an economy based both on the interaction of soul and body, as well as on the maintenance of the radical incommensurability between them. Such an examination would also keep in mind that according to Descartes, the human body was not simply brute matter, but a quasi-intelligent and systematically automatized entity functioning independently of the soul.<sup>11</sup>

In this paper, I will argue that the pineal gland was not simply the place where soul and body met in an uncomplicated convergence and interaction but was instead the very site of the *problem* of the unity between soul and body. The gland itself was the space that encompassed whatever mutuality could exist between them, but it also constituted the *gap* or separation that defined their incommensurability. In the pineal doctrine, discussed primarily in the early though posthumously published, *Treatise on Man*, and in the final work, *The Passions of the Soul*, what at first appears to be an account of the singular anatomical site that fully demarcated any and all interchanges between a body and soul becomes instead a complex meditation on locality, materiality, and the final divisibility of matter and mind.

What I especially want to suggest is that the union of the soul and body which played out in and as Descartes' theory of the brain did something very peculiar to the pineal gland as a material entity and abstract locale where different ontologies converged. In order to facilitate the union between body and soul, the gland, as I will attempt to suggest, became itself a curious object whose ontology was defined by the oscillation between matter and mind. By being staged in this one particular place, the union of the soul and body compelled an otherwise anatomical sub-organ to adopt what I would refer to as an ontologically transitive status—that is, as a body both facilitating but also *undergoing* a translation or transformation from matter to immateriality. Neither soul, but not entirely

body, the pineal gland occupied a middle position somewhere between Descartes' dualism, both ensuring it and yet also disrupting it in the form a union that it needed somehow to guarantee.

This is all to suggest that the category of the Cartesian human person is in need of further consideration, beginning with an understanding of what precarious theoretical obligations Descartes placed on the pineal gland as the object and site that secured the Cartesian human person in the first place. The reason that this is particularly important to reconsider today is that some contemporary scholarship in the history and anthropology of science has imagined that Cartesian neuroanatomy played a foundational role in a historical development which has ultimately come to define the self almost entirely in neuroscientific terms. Vidal (2009) and other scholars have provocatively examined with critical insight the ways personhood has historically and anthropologically been conflated with the brain and nervous system—that a self is rather than *has* a brain—and have discussed the many ethical, political and economic consequences this has for us today.<sup>12</sup> Vidal (2009, pp. 12–13) has suggested that this conflation has its early modern roots, at least in part, in Cartesian neuroanatomy. However, this might suggest that the Cartesian human person was as analogously “cerebral” as we are today. This paper will ultimately put pressure on that assessment precisely by asking how successfully the pineal gland was able to guarantee the soul-body union and unified human person.

## 2. The pineal gland: ontological instabilities

An analysis of the pineal gland, the so-called seat of the soul,<sup>13</sup> must begin in relation to Descartes' metaphysical dualism, or the ontological and functional differentiation of the soul and the body. The body is defined only as extension, while the soul is defined according to its sole capacity to think and its inability to be at all related to extended matter.<sup>14</sup> It is by virtue of this ontological schism that Cartesianism is understood as scientifically flawed, even bankrupt, especially from the standpoint of the contemporary study of the brain.<sup>15</sup>

However, despite Descartes' commitment to his dualism, the soul was nevertheless always figured in some kind of relation to the body. So although Descartes more cautiously suggested in the *Meditations* that “the whole mind *seems* [videatur] to be united to the whole body” (AT VII, p. 86; CSM II, p. 59, emphasis in original), by the time he wrote the *Passions*, the relation was more emphatic: “[the soul] is related solely to the whole assemblage of the body's organs” (AT XI, p. 351; CSM I, p. 339). This relation of the soul to the *whole* body specifies the parameters of the possible, if only still provisional, corporealization of the soul.<sup>16</sup> (As I will explain in section 3 below, this is not at odds with the claim that the

<sup>10</sup> Marion suggests, however, that in so doing, the metaphysics reveals itself as the sole means by which the foundations of certainty could ever have been reached. Garber (2000, p. 223) disagrees to an extent arguing that nothing of the original method is present in the *Meditations*. But Garber does point out how Descartes imagined “that the program of the *Meditations* is not an autonomous philosophical project, but the prelude to a larger scientific program.”

<sup>11</sup> I refer here to the complexity of the body's automatic capacities, some of which I will describe in more detail in the remainder of the paper. These automatic capacities include, for example, vital functions such as the self-regulated beating of the heart which, as Descartes explains in the *Discourse on Method*, is a consequence of the fact that the heat of the heart causes entering blood to rarefy and expand, thereby inflating the organ (AT VI, p. 49; CSM I, p. 135–36). Other automatic capacities include simple sensory-motor reflexes, which rely on the nervous system and the animal spirits, and which I discuss more in footnote 29. In addition to simple reflexes there are slightly more complex automatic movements, a distinction I am drawing from Sutton (1998, p. 77) and which have the added feature that they are ideational to a degree and involve the use of the pineal gland and associative memory (see also footnote 32).

<sup>12</sup> See also Rose (2006, chapter. 7) & Choudhury et al. (2009), and the Critical Neuroscience project at [www.critical-neuroscience.org](http://www.critical-neuroscience.org).

<sup>13</sup> Descartes identifies the gland as the seat of the soul in his letter to Meyssonier (29 January 1640, AT III, p. 19; CSMK, p. 143), as well as in his *Principles of Philosophy* (AT VIII A, p. 315; CSM I, p. 279) and *The Passions of the Soul* (AT XI, pp. 352–53; CSM I, 340); in *Treatise on Man* (AT XI, pp. 176–77; CSM I, p. 106), the pineal gland is called the seat of imagination and common sense.

<sup>14</sup> The following lines from *The Passions of the Soul* are a succinct expression: “We have no conception of the body as thinking in any way at all” (AT XI, p. 329; CSM I, p. 329); “there is nothing in us which we must attribute to our soul except our thoughts” (AT XI, p. 342; CSM I, p. 335); and “the soul is of such a nature that it has no relation to extension, or to the dimensions of other properties of the matter of which the body is composed” (AT XI, p. 351; CSM I, p. 339). For more on the nature of extended substance, see Garber (1992, pp. 63–93).

<sup>15</sup> Antonio Damasio (1994) sums up the criticism in the very title of his book.

<sup>16</sup> In his replies to the sixth set of objections to the *Meditations*, Descartes writes “This is exactly the way in which I now understand the mind to be coextensive with the body—the whole mind in the whole body and the whole mind in any one of its parts” (AT VII, p. 442; CSM II, p. 298). For how Descartes' claim that the soul is joined to the whole body differs from earlier, similar formulations by Augustine and Aquinas, who took the soul to be a principle of life, see Lokhorst (2011) & Aucante (2006, p. 33).

soul's activities were nevertheless primarily located at the pineal gland.)

Furthermore, Descartes was not, in spite of everything, an entirely divisive metaphysician and there are many instances of a more robust ontological inclusivism. For example, in his early *Rules for the Direction of the Mind*, written between 1620 and 1628, Descartes insisted that it is difficult to identify a distinctly *human* understanding that might somehow exist in absolute isolation from the set of other mental faculties that were, through and through, corporeal in nature.<sup>17</sup> And in the *Principles of Philosophy*, when Descartes defined “thought” [*penser*] as the essence of “what we are,” he broadly including under the category of thought understanding and volition as well as imagination and sensory awareness, the latter two being corporeal capacities (AT VIII A, p. 7; CSM I, p. 195).

From this standpoint, the pineal doctrine within Cartesian philosophy was less a simple anatomical elucidation of a metaphysical assumption, but was instead a combined theoretical and empirical challenge. The doctrine was a late formulation of the classical doctrine of the seat of the soul, which throughout much of antiquity and the Middle Ages had been presented as variations of a ventricular theory—that the rational soul rested in one of the cavities of the brain's ventricular system, typically along with the *sensus communis* and the imagination, which occupied the other ventricles.<sup>18</sup> Although earlier authors of influential anatomical treatises, including Galen, Ibn al-Jazzār, and Jean Fernel, had identified the pineal gland, it was Descartes who assigned to it such a novel and noteworthy role in his neuroanatomy by isolating it as the place through which the soul was most immediately conjoined to the body and the location where the soul's functions were most particularly manifest (Aucante, 2006, pp. 240–42; Lokhorst & Kaitaro, 2010). The pineal gland was, in some respects, the first true modern axis point of a philosophical-physiological subject.

However, although the pineal gland's overall functionality was, as I will discuss, both physiologically notable and philosophically expedient, it also engendered some of the greatest theoretical quandaries in Descartes' writings. As I mentioned in section 1, the pineal had to enable the operational compatibility of the soul and body, but it had to do so while ensuring their metaphysical incommensurability. The gland needed from the start to possess a double essence, as a physical site that could unlike any other material entity maintain and facilitate an openness with what was extra-physical.

In order to consolidate the pineal gland's integral and exceptional role in his theoretical psychophysiology, Descartes conferred upon it some significant philosophical and anatomical characteristics. First was the fact that the pineal was situated in “the most interior [*la plus intérieure*] part of the brain” (AT XI, p. 352; CSM I, p. 340)—indeed, “in the middle of all the concavities” (to

Meyssonier, 29 January 1640, AT III, p. 20; CSMK, p. 143). This exceptional interiority should not only be understood in the literal sense that the gland, unattached except by a stem, was positioned at the brain's center.<sup>19</sup> In its greatest anatomical interiority, the pineal gland additionally came to be allegorically linked with the fact that thinking was itself primarily characterized through little more than its state of being interior, “within us,” or “internal.”<sup>20</sup>

The more important attribute, however, was the fact that the pineal was located not only in the middle of the brain, but in the middle of its hemispheric divide, acting as the exception to the brain and body's two-sided symmetry. He writes,

[A]ll the parts of our brain are double, as also are all the organs of our external senses . . . But insofar as we have only one simple thought about a given object at any one time, there must necessarily be some place where the two images . . . can come together in a single image or impression before reaching the soul. . . We can easily understand that these images or other impressions are unified in this gland . . . (AT XI, p. 353; CSM I, p. 340)<sup>21</sup>

The gland's singularity in the midst of the body's dual symmetry allowed it to perform, as the *sensus communis*, the function of unifying the multiplicity of sensory data. Its physical characteristics ensured a formal isomorphy with the soul, thereby grounding its ability to interact with it. The soul was, after all, the essence of unity as such, and in its greatest physical interiority, the pineal gland was discursively confounded with thought itself. Furthermore, when Descartes described the pineal gland as single, he not only meant that it was undivided, but that it was simple and *indivisible*. Descartes never described the pineal gland in terms of its parts or subdivisions, and always addressed it as if it were a total entity.<sup>22</sup>

In this sense, it becomes possible to see that the material register was not the only one in which the pineal gland was operating, since it displayed a set of extra-anatomical features that relied on its morphological characteristics alone. The gland's formal and positional attributes contributed to its capacity to mediate the interaction between the body and soul. Its isomorphic relation with the soul established the basis by which the gland could accomplish what the body on its own could not, and suggests from the outset the possibility that the pineal gland existed in a certain state of oscillation, as far as its ontology was concerned, between the two modes Cartesian substance.

But ultimately, it was not the pineal gland's formalism *tout court* that acted as the condition for the body's “intermixing”<sup>23</sup> with the soul. The gland's morphological characteristics alone could not allow it entirely to transcend the strictures of Cartesian materialism, since it was metaphysical obliged as a physical entity to abide by the nature of matter, defined only as extension.<sup>24</sup> The gland had

<sup>17</sup> “As for ourselves, there are only four faculties which we can use for this purpose [of knowing], viz. intellect, imagination, sense-perception and memory. It is of course only the intellect that is capable of perceiving the truth, but it has to be assisted by imagination, sense-perception and memory if we are not to omit anything which lies within our powers” (AT X, p. 411; CSM I, p. 39). For Descartes, memory, imagination and sense-perception are all faculties rooted in corporeal-material processes.

<sup>18</sup> See Neuburger (1981, pp. 25–30) and Finger (1994, pp. 18–23). For accounts of the *sensus communis*, both philosophically and anatomically in relation to Descartes see Clarke & Dewhurst (1972), Sepper (1996, especially chapter 1), Summers (1987, especially chapter 5), and Keele (1957).

<sup>19</sup> Krell (1987, p. 216) does point out the fact that Descartes initially did not describe the pineal as being at the center of the brain, but later revised that view.

<sup>20</sup> Catherine Malabou first made this observation in a 2007 seminar at the University of California, Berkeley. In the *Principles of Philosophy*, Descartes defines thinking as “everything which we are aware of as happening within us” (AT VIII A, p. 7; CSM I, p. 195). In the *Passions*, Descartes writes, “It is easy to recognize that there is nothing in us which we must attribute to our soul except our thoughts” [*Il est aisé de connaître qu'il ne reste rien en nous que nous devons attribuer à notre âme, sinon nos pensées*] (AT XI, 342; CSM I, 335). And in his replies to the sixth set of objections to the *Meditations*, he describes the “inner [*interna*] awareness which always precedes reflective knowledge” (AT VII, p. 422; CSM II, p. 285).

<sup>21</sup> Descartes writes in a letter to Mersenne that the pineal gland is the “only solid part in the whole brain which is single” (24 December 1640, AT III, p. 264; CSMK, p. 162).

<sup>22</sup> Voss (1993) has identified the ways in which the pineal gland deviates from other material entities in the Cartesian universe, based on how it does not conform to Descartes' “microreductionism.” For Voss, this is what renders the pineal gland “deeply inexplicable” (134). My point is not to abandon the pineal gland for this reason, but to try to understand the dimensions of its inexplicability.

<sup>23</sup> “Mêlé” in French; “permixtum” in Latin.

<sup>24</sup> Descartes writes in the *Principles*, “the nature of matter, or body considered in general, consists . . . simply in its being something which is extended in length, breadth and depth” (AT VIII A, p. 42; CSM I, p. 224).

to remain anchored in its materiality, which is important since the soul, as Descartes writes in the *Discourse*, “does not require any place” (AT VI, p. 33; CSM I, p. 127). Being without location or spatial positionality, the soul was not *in* the body to be sure, but it was also not *outside* the body either. If the pineal gland were formally to correspond too closely to the soul, then it would, precisely on the basis of its physical features and positionality alone, come to be equivalent with what was without any sense of location at all. This would suggest that the formal organization of a material object could allow for an abstraction beyond the point of any measure of space.

That said, the soul was not entirely devoid of spatial referentiality. As I explained at the start of this section, the soul, although without extension, size, shape, or position, nevertheless cohered in something akin to the organizational totality of the body—that is, the body not as an accumulation of discrete parts but as an organizational whole, in the totality of which a soul was present. As Descartes writes in the *Passions*, the soul is separated from the body when its assemblage of organs is divided because “the body is a unity which is *in a sense indivisible* because of the arrangement of its organs” (AT XI, p. 351; CSM I, pp. 339–340, emphasis added). This claim, made in Descartes’ final text, inverts an earlier sentiment from the *Meditations*, published eight years prior: “There is a great difference between the mind and the body, inasmuch as the body is *by its very nature always divisible*, while the mind is utterly indivisible” (AT VII, pp. 85–86; CSM II, p. 59, emphasis added).

It would follow that, while neither within, without, nor tantamount to the body, the soul was nevertheless *of* the body somehow. To understand the nature of the soul’s bodily connection, it is important to consider that the pineal gland was as curiously linked with the soul as it was with the rest of body, properly understood. We must therefore turn to the pineal gland’s own relation with the body or, to put it another way, to an aspect of the body’s relation to itself.

### 3. The physiology of the nerves and gland: material redoublings

Descartes’ actual elaboration of the general operations of the brain and nerves, outlined primarily in *Treatise on Man* and *The Passions of the Soul*, was complex and did not necessarily always involve the pineal gland. For Descartes, the nervous system was comprised of the distribution of a sinuous network of conduits that extended throughout the body.<sup>25</sup> Each nervous conduit consisted of a single linear thread extending from one of the many tubules that emerged from the brain, carrying the animal spirits. The animal spirits were subtle matter initially distilled from the blood, having “no property other than of being extremely small bodies which move very quickly, like the jets of flame that come from a torch” (AT XI p. 335; CSM I p. 332). These animal spirits were ultimately responsible for the general spectrum of nervous action, which included the basic stimulation of nerves, sensory perception, and the movements of muscles.<sup>26</sup>

The nervous system was on its own capable of conducting an automatic and mechanical set of actions that Descartes in *Treatise on Man* likened to the action of a church organ:

You can think of our machine’s heart and arteries, which push the animal spirits into the cavities of the brain, as being like the bellows of an organ, which push air into the wind chests; and of external objects, which displaces certain nerves, causing the spirits from the brain cavities to enter certain pores, as being like the fingers of the organist, which press certain keys and cause the wind to pass from the wind chests into certain pores. (AT XI, p. 165; *WW*, p. 140)

In this general picture of the nervous economy, the animal spirits, after being rarified in the heart and from the blood (AT XI, p. 130; *WW*, p. 106), rise up into the cavities of the brain.<sup>27</sup> If, to use Descartes’ own example from *Treatise on Man*, a fire were placed too close to a part of the body (in this case, the foot), the force of the fire’s heat would stimulate the skin, thereby pulling the nervous fiber connected to it. That fiber leads all the way to the brain, and when it is pulled, it simultaneously opens the entrance to a pore, in the same way that “when you pull on one end of a cord you cause a bell hanging at the other end to ring at the same time” (AT XI, p. 142; *WW*, p. 117). When the entrance to the pore is pulled open, the animal spirits from a particular cavity are carried down “some to the muscle that serve to pull the foot away from the fire, and some to the muscles that make the hands move and the whole body turn in order to protect itself” (AT XI, p. 142; *WW*, p. 117).<sup>28</sup>

Again, in this picture of automatic nervous action, the pineal gland and consequently the soul were not involved in the least (Gaukroger, 1995, pp. 279–281; Sutton, 2000, p. 709). Indeed the pineal gland was effectively bypassed, and the nervous system enacted what Sutton (1998, p. 77) has called a simple automatism, or what we may more commonly call reflex action.<sup>29</sup> But even this stimulus–response function of the brain and nerves reveals something important, which is that, although motor reactions involve the actual pouring of animal spirits into muscles in order to inflate them—which is why the nerves “can indeed be compared to the pipes in the mechanical parts of [the grottoes and fountains in the royal gardens]” (AT XI, p. 131; *WW*, p. 107)—the sensory side of nervous stimulation does not involve the movement of animal spirits but the instantaneous movement of the entire nervous fiber. As Descartes explains, “When [sensory fibers] are moved, with however little force, they *simultaneously [au même instant]* pull on the parts of the brain from which they come” (AT XI, p. 141; *WW*, p. 117, emphasis added).

But this does not necessarily exclude the role of animal spirits from sensory stimulation. As Descartes writes in the *Passions*, the animal spirits permeate nervous conduits at all times—“they never stop in any place” (AT XI, p. 335; CSM I, p. 332)<sup>30</sup>—but it is precisely this permeation, otherwise necessary for motor action and the inflation of muscles, that ultimately causes

the [nervous] fibers to remain so completely free and extended that if anything causes the slightest motion in the part of the body where one of the fibers terminates, it thereby causes a movement in the part of the brain where the fiber originates, just as we make one end of a cord move by pulling the other end. (AT XI, p. 337; CSM I, p. 333).

<sup>25</sup> In the *Passions*, for example, he writes, “There is the marrow, or internal substance, which extends in the form of tiny fibers from the brain, where they originate, to the extremities of the parts of body to which they are attached” (AT XI, p. 337; CSM I, p. 333).

<sup>26</sup> For more on the animal spirits, historically and conceptually, see Sutton (1998, chapter 2) and Aucante (2006, pp. 230–36).

<sup>27</sup> See also *Passions*, Part I, paragraph 10 (AT XI, pp. 334–35; CSM I, pp. 331–32).

<sup>28</sup> Canguilhem (1955, pp. 34–35) has summed up Descartes’ account of automatic nervous action as an immediate centripetal “traction” of the nervous fiber, followed by a centrifugal motor reaction of the “propagation” or “transport” of animal spirits (Canguilhem, 2000, p. 183).

<sup>29</sup> There are, to be clear, a range of automatic actions in the Cartesian body. Descartes writes in *Description of the Human Body*, “It is true that we may find it hard to believe that the mere disposition of the bodily organs is sufficient to produce in us all the movements which are in no way determined by our thought” (AT XI, p. 223; CSM I, p. 315). But we need to distinguish, for example, the automatic movements of the heart which I described in footnote 11 above from the simple automatic reflexes of the nervous system that do not rely on the pineal gland, and again from habituated or associatively learned behaviors which actually do (at least initially) rely on the pineal gland and the soul.

<sup>30</sup> This claim first appears in *Treatise on Man*: “The spirits never stop in any one place” (AT XI, p. 172; *WW*, p. 145).

Descartes again uses the metaphor of pulling a cord (this time without the bell). In order for the movement of a cord to be instantaneous at both ends, the cord must be taut. It is, as we see, the permeation of animal spirits otherwise necessary for motor action that gives the nervous fibers their necessary tautness so that when one end is pulled, so simultaneously is the other.<sup>31</sup> From this standpoint, we could say that the brain is being stimulated at the very same instant as the peripheral sensory organ.

The pineal gland complicates the picture of the nervous economy somewhat, insofar as it introduces an ideational register into the process. The presence of the pineal gland is equivalent to at least a minimal presence of the soul, either perceptually or volitionally (Aucante, 2006, p. 244). But the mechanics of the nervous system have not altered. The only difference is that the conduits act directly on the gland instead of bypassing it, thereby causing perception in the soul; and an automatic motor response does not necessarily follow, since once the soul perceives an external object or stimulation, it ostensibly chooses to act in one way or another, or not to act at all (although prior habituation and associations can often manifest apparently automatic reactions).<sup>32</sup>

Furthermore, sensory stimulation, even when it acts upon the gland, is still enacted through the instantaneous movement of nervous conduits. One important difference is that instead of involving the instantaneous pulling of a nervous thread, the pineal gland is acted upon by virtue of an instantaneous tracing of a figure on its surface, a point I will focus on in section 5. The important point is that the pineal gland is being acted upon as immediately and instantaneously as any sensory affection that the body receives or undergoes peripherally. In the early *Rules for the Direction of the Mind*, Descartes described this simultaneity between the pineal gland and the corporeal periphery through the analogy of a writing instrument:

When an external sense organ is stimulated by an object, the figure which it receives is conveyed *at one and the same moment* to another part of the body known as the ‘common’ sense [i.e., the pineal gland], *without any entity really passing from the one to the other*. In exactly the same way I understand that while I am writing, at the very moment when individual letters are traced on the paper, not only does the paper move, but the slightest motion of this part cannot but be *transmitted simultaneously to the whole pen*. All these various motions are traced out in the air by the tip of the quill, even though I do not conceive of anything real passing from one end to the other. Who then would think that the connection between the parts of the body is less close than that between the parts of the pen? (AT X, p. 414; CSM I, p. 41, emphasis added)

The “parts of the body” are, in other words, as proximately and simultaneously linked as are the parts of a pen. Sensory stimulations occurring in sensory organs instantaneously stimulate the pineal gland in a way that is isomorphic or structurally correspondent to the peripheral stimulation (Hatfield and Epstein, 1979, p.

374; Sutton, 1998, p. 103). The pineal does not receive a substituted version of sensory stimulation (a representation in a weak sense). Instead it receives that stimulation (or the sensory image) as directly as the sensory organ did. From the standpoint of sensory-perception, what affects the body is also already affecting the pineal, in a way that suggests that the gland reduplicates the body’s sensory affections, insofar as sensory affections are occurring at the body’s periphery and also at the pineal gland at one and the same moment.

I do not mean by this that the pineal gland is receiving a pure and unadulterated transmission from the sensory organs, but rather that whatever is transpiring in the body from, at least, a sensory standpoint is transpiring in the pineal gland at the very same moment. To use an example that Descartes provides in the *Passions* (paragraphs 35–39, AT XI, pp. 356–59; CSM I, pp. 342–43), rarely does one see “the shape of animal” without associating that shape to prior memories. Let us say, as Descartes does, that the “shape is very strange and terrifying” and “has a close relation to things which have previously been harmful to the body.” Then, not only is the pineal gland receiving the image of that shape as instantaneously as the eye, but, first, the “spirits reflected from the image formed on the gland” are also turned towards the nerves of the heart, thereby “[inducing] a movement in the gland through which fear enters the soul;” and, second, other spirits “*at the same time* proceed to the nerves which serve to move the legs in flight” and this “causes another movement in the gland through which the soul feels and perceives this action” (AT XI, pp. 359; CSM I, pp. 343, emphasis added). Thus, the total “perception” of the terrifying animal involves a sensory transmission, an immediate association, the agitation of the heart (or the feeling of fear), and the turning of the body to run. But this total perception, dispersed anatomically across the eyes, brain, heart, and legs is, I would argue, reduplicated upon the pineal gland.<sup>33</sup>

This claim makes more sense if we realize that the pineal gland is *organizationally* reduplicating the body’s sensory affections. The pineal gland, we must recall, is a material unity. But the body, so far as Descartes describes it in the *Passions*, is an *organizational* unity, indivisible not materially as the gland is, but only insofar as the body’s assemblage comprises a whole larger than the sum of its parts (AT XI, p. 351; CSM I, p. 339). This can explain why in the *Passions*, Descartes says that the soul is both conjoined to “the whole assemblage of the body’s organs” (AT XI, p. 351; CSM I, p. 339) and yet is also most particularly manifest in the pineal gland. The pineal gland is like a virtual reduplication of the organizational totality of the body—it is itself the material unity that virtually re-presents the organizational unity of the body, to which the soul must necessarily be joined.

As I argued in section 2, despite the gland’s morphological correspondence with the soul, it remained anchored in its materiality. And yet, as I have attempted to argue in this section, this materiality was still somehow different from the matter of the body properly understood. While the pineal gland was a discrete anatomical organ, it was also the virtual re-presentation of the body as an

<sup>31</sup> Descartes also describes this in *Treatise on Man* (AT XI, 174; WW, p. 146).

<sup>32</sup> Here I refer to what Sutton (1998, p. 77) has called a complex automatism. In the *Passions* (paragraph 36, AT XI, p. 356; CSM I, p. 342) Descartes describes how previous memories and associations can dispose the brain to act in different, seemingly automatic ways. Thus the sight of a threatening object can, based on prior experiences, induce in one person fear and the impetus to flee and in another person courage and impetus to remain. As Sutton (2000, p. 710) explains, the associative nature of Descartes theory of memory means that behaviors can be conditioned and, like programs, be later carried out without the presence of the soul, even if those actions are representational. This is what Descartes meant when he wrote in *Treatise on Man*, “But the effect of memory that seems to me to be most worthy of consideration here is that, without there being any soul present in this machine, it can naturally be disposed to imitate all the movements that real men – or many other similar machines—will make when it is present” (AT XI, 185; WW, 157).

<sup>33</sup> Beyssade (1983, pp. 119–24) has argued that, in relation to the pineal gland, the movement of animal spirits are simultaneously and indistinguishably sensory-motor, and that there is no strict way to isolate when a particular flux is acting one way or another, since as I argue above, the very same permeation of animal spirits that enables muscular movement also maintains the tautness of the nervous fiber and its ability to reflect an image onto the pineal gland. The general flux of animal spirits, writes Beyssade, “can be read or viewed in both senses . . . . Once the current [of animal spirits] is established, it is no longer possible to tell whether it is sensory or motor” (p. 123, my translation). This suggests that the pineal gland constitutes the virtual reduplication of not only every sensory affection but also of every motor action for which the soul has any possible involvement.

organizational unity. We might begin to see how the pineal gland displays properties that place it like a third term somewhere between the soul and the body—morphologically and analogically related to the former, while virtually and organizationally related to the latter. Still, this third term constituted the only site of the possible encounter between the soul and body, and while it somehow had to give room to this exchange, we have not yet uncovered exactly how.

#### 4. Cerebral fictions and fortifications

In order to gain a complete picture of the pineal gland along with an understanding for how it staged the union of the soul and body, it will be necessary to highlight the additional characteristics that Descartes attributed to the gland, especially those that were not, strictly speaking, related to the gland's role in Descartes' psychophysiology. In this section I will examine how the pineal gland was described through the motif of security as well as through the Descartes' dependence on fiction and conjectural devices, both of which will be integral in elucidating the way in which the gland staged the soul-body union.

In a 1640 letter to Mersenne, Descartes responded to objections made against the pineal doctrine by the French physician, Christophe Villiers. Villiers argued that the pineal gland could not be the seat of the soul because it was susceptible to injury and harm no differently than any other part of the brain. "This is no reason why it should not be the principal seat of the soul," replied Descartes. "Although it is very small and very soft, it is situated in such a well-protected place that it is almost immune from illness" (30 July 1640, AT III, p. 123; CSMK, p. 149). Descartes was referring to the gland's alleged location, at nearly the exact center of the brain, as what ensured its ongoing protection and fortification from illness. While the description is brief, it is rooted in some very significant aspects of seventeenth-century brain anatomy, as well as in some underlying aspects of Descartes' metaphysics.

First, seventeenth-century anatomists tended to use metaphors of security and protection to describe the function of the brain's anatomy. Two prominent anatomists who used such metaphors were English physicians Thomas Willis and Humphrey Ridley. Willis wrote that the brain's major division into hemispheres and lobes "seems to be designed for its greater safety . . . so that the brain, like a castle, divided into many towers or places of defense, is thereby made the stronger and harder to be taken" (1681, p. 91). Ridley described the brain as "like a Castle, divided into many Towers or places of defense" and structurally "designed for its greatest safety" (1695, p. 91).<sup>34</sup>

Unlike other organs in the body, such as the eye or the heart whose functions might be deduced at least in part through the recognizable isomorphy to objects and mechanical constructions in the world, the precise functions of the brain remained opaque (Canguilhem, 1994, p. 92). It lacked identifiable motions and physical operations, outside of secretion and blood circulation. It would make sense that the brain's anatomical structure—the complexity of its folds and convolutions—would be imagined as functioning simply to protect the rational mind that resided in it. Through the figure of the castle, Willis and Ridley took the brain to be the stronghold for the mind, built upon a design that could stave off the evils of physical illness or harm.

Although Descartes employed no explicit fortress-like metaphors to describe the necessarily supple yet sheltered pineal gland, nevertheless metaphors of security, stability and solidity abounded within and to an extent propped up his system. The essence of Cartesian philosophy itself was, as a theoretical project, devoted less to imputing reason into subjects, than it was to ensuring the stability of fundamental and general principles. Indeed, the expressed objective of the *First Meditation* was "to establish anything in the sciences that was stable [*ferme* (F), *firmum* (L)] and likely to last" (AT VII, p. 17; CSM II, p. 12). The thematic of stability, fixity, and certainty referred as much to the foundational principles being sought as to the regulative practice involved in seeking them. Metaphysics then, in essence and as a meditative practice (Sepper, 2000), was equivalent to the construction of a firmament, in the sense of a stable principled ground but also as an ideational vault that held soundly like the heavens above Descartes' head and to which he could always turn when any current principle seemed no longer to be valid.

In the *Meditations*, Descartes sought to isolate an immovable ground—"just one thing, however slight, that is certain and unshakeable" (AT VII, p. 24; CSM II, p. 16)—which ultimately became the *Cogito*, the formulation of equivalence between a thinking and existing "I." Upon discovering it at the end of the *Second Meditation*, Descartes decided to "stop here and meditate for some time on this new knowledge I have gained, so as to *fix it more deeply in my memory*" (AT VII, p. 34; CSM II, p. 23, emphasis added). Given that memory was a distinctly cerebral faculty,<sup>35</sup> the statement can be rephrased to say that Descartes sought to deposit his newly discovered stable ground of certainty within the recesses of a brain that could offer the same protection to it as it could to the well-protected pineal gland. We might say that, just as a firm and unshakeable first principle grounded and stabilized the metaphysics, the pineal gland—because it was so well protected by the brain—was the place that stabilized, held firm, and consequently secured the potentially precarious encounter between body and soul, thereby ensuring the possibility of an embodied human person.

The second important motif is related to the extremely conjectural, nearly fictive, nature of the pineal gland's operations and role within Descartes' writings. Descartes in a fairly systematic way engaged in the strategic deployment of different categories and modalities of artifice, conjecture, and even fiction as the means by which to construct both his metaphysics and natural philosophy. Some of these speculations and imaginings functioned quite famously as important formal and thematic elements of particular texts. In the *Meditations*, for example, Descartes specifically employed the methodological fiction of an evil demon who deceives Descartes into believing his experiences are real.<sup>36</sup> This ruse was meant to be the technique by which the absolute indubitability of the *Cogito* was achieved, an illusion not only by which certainty was discovered, but also by which illusion could itself be regulated and ordered. On the one hand, Descartes employed the ruse of the evil demon to combat the true epistemic threat of the dream,<sup>37</sup> an illusion so illusory, that there was no way for a dreamer to confirm whether or not she was dreaming. This ruse was not only productive in discovering the certainty of the *Cogito* but, in the *Third* and *Fourth Meditations*, in confirming the subject's epistemic and ontological finitude. It was this finitude which in the *Sixth Meditation* was made equivalent to the human subject's corporeal nature. And so the

<sup>34</sup> Ridley continues, "If perchance any evil should happen to one or both the foremost Lobes, yet the latter, for that they are separated, may avoid the contagion of the neighboring and farther spreading of evil" (1695, p. 91).

<sup>35</sup> "I shall content myself with telling you more about how the traces are imprinted on the internal part of the brain, marked B, which is the seat of memory," *Treatise on Man* (AT XI, p. 177; WW, p. 150).

<sup>36</sup> "I shall think that the sky, the earth, colors, shapes, sound and all external things are merely the delusions of dreams which he has devised to ensnare my judgment" (AT VII, pp. 22–23; CSM II, p. 15).

<sup>37</sup> The visions of which "are like paintings, which must have been fashioned in the likeness of things that are real" (AT VII, p. 19; CSM II, p. 13).

bodily senses, which in the *First Meditation* were occasionally deceptive and illusory, became a necessary erroneousness for the human, or combined soul-body unit, whose corporeal essence ensured that it would remain finite.

In Descartes' physiology, the strategy of fiction was used quite directly to describe the body itself, as a machine of simulation or a theater of effects built on hidden causes (Des Chene, 2001; Kahn, 2006). The body was presented as a device on view, the manifestation of uncanny spectacles which in *Treatise on Man* were initially likened to the artificial fountains in grottos and royal gardens built on concealed mechanisms that “unwittingly cause the movements which take place before [visitors'] eyes” (AT XI, p. 131; CSM I, p. 101). For Descartes, the body's theatricality assumed a simulative prowess such that, on its own, “without there being any soul present in this machine, it can naturally be disposed to imitate all the movements that real men—or many other similar machines—will make when it is present” (AT XI, p. 185; WW, p. 157).

But Descartes' overall use of artifice was employed less as a thematic or formal device, and more as an explicit and quite important *methodological* strategy, particularly in his natural philosophy. Descartes relied heavily on the strategy of conjecture and hypothesis—a theoretical imagining predicated on the plausibility of a conjectural claim—when valid inductions were not possible, or when absolute certainty could not entirely be achieved (Hatfield, 1988).<sup>38</sup> Although such conjectural hypotheses were directed towards considering the ways in which nature *could* possibly behave, and not in adjudicating nature's true behavior, they nevertheless needed to account for, or at least be plausibly compatible with, the actual facts of empirical observation (Laudan, 1981). Descartes most notably employed these conjectural ploys in his primary book on physical nature, *The World* (also called *Treatise on Light*), which included as its second part, the *Treatise on Man*. Early in *The World*, Descartes attempted to render viable some of his proposed and speculative formulations on the nature of matter by conjuring up and narrating a hypothetical universe in which his formulations could be valid. He writes,

I would be happy to add a number of other arguments to make my opinions more plausible [*plus vraisemblables*]. But so as to make this long discourse less boring for you, I want to wrap up part of it in the guise of a fable [*dans l'invention d'une fable*], in the course of which I hope the truth will not fail to manifest itself sufficiently clearly ... (AT XI, p. 31; WW, p. 21)<sup>39</sup>

It is hard not to notice the rhetorical transition from the language of hypothetical plausibility to the language of fables and fabrications. There is a thin line between the methodological strategy of hypothesis or guessing, and the category of fiction and fabulation. Their equivalence, however, in Descartes' natural philosophy was predicated on the plausibility, viability, and compatibility of the claim in the face of empirical observation.

The pineal gland was a similar conjectural device. As a hypothetical formulation it could account for the general operations of the nerves but also constitute the anatomical part of the body best suited to join with a simple and indivisible soul. In *Treatise on Man*, as in *The World*, Descartes stipulated that the body being described was not *our* body, not the *human* body, but a fabricated imitation—a machine that simply happened to conform exactly to our own bodies. The body in question was a contrivance, the fiction of a soulless automaton “which God forms with the explicit intention of making it as much as possible like us” and which is composed of parts “just like those parts of our own bodies having the

same names” (AT XI, p. 120; WW, p. 99–100; Des Chen, 2001, p. 155).

The entire treatise, then, was conjectural insofar as it was presented as a set of highly probable claims, but about an entirely imagined body fabricated by God to resemble ours. In this sense, the pineal doctrine needed hypothetically to account successfully for the observable operations of the brain and nervous system. But it also needed to comprise a fiction of an entirely different order. The pineal gland had to be the imagined site of a nearly unimaginable encounter between soul and body, something like an anatomical “*invention d'une fable*” to account for the soul-body union, which Descartes *promised* to outline in its entirety, but which he never did. The pineal doctrine was a hypothesis/fable that ultimately encompassed what remained a historical fiction in Descartes writings, by virtue of its absence.

Krell (1987) has elaborated on the fictional nature of Descartes' theory of the pineal gland by focusing, from a deconstructive standpoint, on its surprising supplementarity and on the fact that the doctrine was susceptible to some deep and irresolvable paradoxes. Although I will return to some of Krell's claims in sections 5 and 6, I want to underscore the extent to which within Descartes' psychophysiology the pineal gland was as much an actual, material bit of anatomy, available to observation and dissection, as it was a hypothetical entity functioning in importantly fictional ways. I want to emphasize, however, that the scope of its fictitiousness was linked quite directly to the motif of security I described above. The gland needed to safeguard an encounter, the union of soul and body, and the production of a human, embodied person, while also ensuring that the different ontologies involved in that encounter could be united, but never confounded. It was in some ways performing an impossible task, securing a paradoxical convergence. This is why, from this standpoint alone, the pineal gland needed to assume a fictional quality. This is also why, as I will argue in the following section, the encounter between body and soul taking place at the pineal gland was described through a language of fiction.

## 5. Figuring the soul-body union: material translations

The nature of the union of the soul and body is not necessarily encapsulated by the particular details of their interaction, which, broadly understood, was defined in terms of the body's ability to affect the soul—either by causing perceptions, imaginings, and memories or inducing feelings and emotions—and in terms of the soul's ability to act on the body through the action of its will. But aspects of the union can be elucidated through a more detailed assessment of the interaction and through a nuanced reading of the role played by the pineal gland—the “necessary crossing point [*point de passage obligé*]” as Beyssade (1983, p. 118) calls it—in both enabling and managing the interaction.

Descartes only outlined one actual mechanism to describe the encounter through which the soul and body interacted, and it was based in part on a theory of sensory-perception formulated as early as the *Rules for the Direction of the Mind*. In the *Rules*, Descartes made use of an early wax metaphor: “Sense-perception occurs in the same way in which wax takes on an impression from a seal” (AT X, p. 412; CSM I, p. 40). Descartes continues:

It should not be thought that I have a mere analogy in mind here: we must think of the external shape of the sentient body as being really changed by the object in exactly the same way as

<sup>38</sup> Hatfield (1988) discusses Descartes' belief in the legitimacy of conjectural hypothesis in his willingness to accept less than absolute certainty when it came to claims about the physical world.

<sup>39</sup> For a brief analysis of how hypothesis is functioning here, see Clarke (1992, pp. 260–65). Romanowski (1973) discusses the ambivalence between fiction and hypothesis specifically in this cited passage.



the shape of the surface of the wax is altered by the seal . . . This is a most helpful way of conceiving of these matters, since nothing is more readily perceivable by the senses than shape, for it can be touched as well as seen. (AT X, pp. 412–413; CSM I, p. 40)

Indeed, shape was for Descartes an all-encompassing sensory-perceptual constraint. He extended the applicability of shape even to seemingly qualitative perceptual attributes, like color.<sup>40</sup> Shape simply defined the delineation of any physical affection that could occur in a sense organ; and since a sense organ was substantially only extended matter, Cartesian sense-perception was reducible to the distinguishable *form* of a particular physical impression which also impressed its shape upon the site of common sense, or the pineal gland.

In *Treatise on Man*, Descartes elaborated on the role of the pineal gland in the dynamics of the impression of forms. As I explained in section 3, impressions that were incurred sensibly at the perimeter of the body *simultaneously* resulted in animal spirits being “trace[d] . . . on the surface of gland H,” or the pineal gland’s exterior surface (AT XI, p. 176; WW, p. 149).<sup>41</sup> Every sentient occurrence that transpired for the body (e.g., perception, activity, passivity, etc.) left a “trace” of itself in the form of what Descartes called a “figure” on the surface of the gland. By introducing the animal spirits as the intermediaries that effectively transposed the shape of impressions throughout the nervous system, Descartes replaced the earlier language of impressed shapes for that of traced figures. But the turn to a language of traced figures (and, on occasion, “images”) did not transform these physical impressions into imagistic representations. Instead,

by figures I mean not only things that somehow represent the position of the edges and surfaces of objects, but also anything which, as I said above, can give the soul occasion to sense movement, size, distance, colors, sounds, smells, and other such qualities; and even things that can make it sense pleasure, pain, hunger, thirst, joy, sadness, and other such passions. (AT XI, p. 176; WW, p. 149)

The traced figure changed the details of Cartesian sense-perception, without changing the underlying operation. The very same affection that stimulated the sensory organ was simultaneously manifest on the pineal gland’s surface; they were traced or impressed there by the animal spirits as an image or projection. How a bodily affection like hunger or odor could be traced as a figure onto any surface emerges from a premise that had gone unchanged since the *Rules*—namely, that all affections of the body are material in nature, and are as such comprised of changes to the state of extension, and thereby shape. The shape, figure, or image of hunger, for example, would simply be a particular form that somehow reflected the material state of nutritive want.

In a significant passage from *Treatise on Man*, Descartes explains the final step in the dynamics of the pineal gland’s interaction with the soul:

Now among these figures, it is not those imprinted on the organs of external sense, or on the inside surface of the brain, that should be taken as ideas, but only those traced in the spirits on the surface of the gland H, where the seat of imagination and common sense is. That is to say, only these should be taken as the forms or images which, when united to this machine, the

rational soul will consider directly when it imagines some object or senses it. (AT XI, p. 176–77; WW, p. 149)

The figures or forms traced onto the surface of the pineal gland were what the soul received as ideas or mental perceptions. Descartes emphasized the category of *material* idea: “I wish to apply the term ‘idea’ [*idée*] generally to all impressions which the spirits are able to receive as they issue from gland H” (AT XI, p. 177; WW, pp. 149–50). Descartes’ early use of the term *idea*, specifically in *Treatise on Man* referred to a corporeally bound image and should be differentiated from a strictly intellectual act of thinking (Michael & Michael, 1989), the latter being the essence of an immaterial soul and to ideas for which there existed no imagistic correlate. Animal spirits could either trace figures onto the pineal gland’s exterior surface as they entered the brain cavity, or receive them as they exited, which would suggest that the soul somehow traced figures as well onto the interface which was the gland’s outer surface.

But it is vital at this point not to confound the figures traced on the pineal gland’s surface—in other words, that which the soul “will consider directly”—and the ideas that the soul actually has because of those figures. It is true that Descartes himself discursively conflated the “figures” that were traced on the pineal gland with “the ideas which are formed on its surface” (AT XI, p. 184; WW, p. 155). He writes, for example, that “the idea of [the] movement of bodily parts just consists in the way in which the spirits flow from the gland, and thus it is its idea that is the cause of the movement” (AT XI, p. 181; WW, p. 153). This conflation is, I would argue, formal and not ontological.<sup>42</sup> A figure traced on the pineal gland’s surface will invariably count as an idea—it cannot *not* be an idea for the soul, so long as a soul is joined to the body. Conversely, the formation of an empirical idea by the soul will invariably flow from the gland as a particular figure. They comprise a composite event, but they are not therefore identical.

The figure on the gland’s surface is distinguishable from the idea that the soul receives from it for several additional reasons. First, even though the soul’s ideas are corporeally bound, they are not therefore corporeal in themselves. The soul has a material or empirical representation in the sense that is in “possession of a mental state with a particular phenomenal content” (Hatfield, 1990, p. 53).<sup>43</sup> It is, in other words, not the phenomenon itself. The figure would more accurately count as the phenomenon since, in the case of sensory-perception, the figure traced on the pineal gland maintains a physical continuity with the impression on the sensory organ and with the external object that caused the impression. As Descartes explains in a 1641 letter to Hyperaspistes, “The mind, though really distinct from the body, is none the less joined to it, and is affected by traces impressed on it [i.e., the body], and is able to impress new traces on its own account” (AT III, p. 424; CSMK, p. 190). Indeed Hatfield and Epstein (1979) have asserted, “At the pineal gland body and mind are ‘united,’ so that motions in the material nervous system produce sensations in the mind” (p. 375). They call the idea formed by the figures “a mental correlate of the pineal image” (p. 376), and the gap between the pineal image and the mental correlate represents “the boundary between body and mind” (p. 376). It is, after all, the soul that sees and perceives, not the brain. If the figures on the pineal gland were ideational or representational in themselves, then it would be, as Descartes

<sup>40</sup> “Whatever you may suppose color to be, you will not deny that it is extended and consequently has shape” (AT X, p. 413; CSM I, pp. 40–41).

<sup>41</sup> In *Treatise on Man*, Descartes refers to the pineal as “gland H” in order to make reference to accompanying visual diagrams.

<sup>42</sup> Here I am disputing Sutton’s (1998, p. 57) assertion that the ideas and figure are equivalent. It is true that the traced figure can be stored in and as memory. In *Treatise on Man*, Descartes explains how the figures can be preserve “in such a way that the ideas that were previously on the gland can be formed again long afterwards without requiring the presence of the objects to which they corresponded” (AT XI, p. 178; WW, p. 150). The memory trace now stands in for the object, and can even be confused and associated with other memory traces, but it cannot be recalled unless it is once again traced on the pineal surface.

<sup>43</sup> Nadler (2006) describes how the term *idea* tends to have two vacillating meanings for Descartes—pure mental acts and empirical representations.

facetiously put it, “as if there were yet other eyes within our brain” (AT VI, p. 130–31; CSM I, p. 167).

I argue instead that figures only count as ideas once they have passed beyond the materiality of the pineal gland. But the question does remain, how does the soul receive the figure as an idea? Does the union of the soul and body, so far as it is staged at the pineal gland, simply return us to an irresolvable dualism? I would argue that an answer begins with a closer inspection of the site of the tracing itself, namely the surface of the gland. The exterior surface must be understood as acting in a double capacity. On the one hand, it constitutes a kind of written surface on which the figure was “traced” [*tracer*] or “imprinted” [*imprimer*]. Indeed the gland itself was “composed of very soft matter which is not joined to or part of the substance of the brain” (AT XI, p. 179; *WW*, p. 152), making it pliant enough to receive a mark. Its suppleness, however, was not so permanent as to prevent those figures from being erased shortly after being traced. Permanent pliability—which is to say, the condition of memory—was a feature reserved for the solid portions of the brain, not the pineal gland (Sutton, 1998, pp. 50–66). Figures imprinted onto the gland’s inscriptive surface were intelligible to the soul as ideas. The inscription itself, in other words, was equally as important to the process as were the particular figures involved. The tracing amounted to a kind of writing.

On the other hand, more than just a writing surface and precisely because the figures were never to be preserved, the exterior wall of the pineal gland also acted along the lines of a metaphysical threshold, the final “boundary”—to quote Hatfield and Epstein (1979, p. 376) again—separating body from mind. Still this boundary was not fully impenetrable; otherwise figures would be prevented from being traced in the first place and therefore received as ideas. The pineal gland possessed a limited penetrability—a writing surface but also a boundary. The figures were legible (as a writing surface) but not in a pure and unadulterated way (or else there would be no boundary). In other words, some sort of conversion or movement across the boundary would have been necessary.

This is in keeping with an important remark that Descartes makes in the *Optics*, where he additionally discusses the formation of the figure within the brain (in the *Optics*, the figures are referred to as “images”). He writes, “We must at least observe that in no case does an image have to resemble the object it represents in all respects,” and that the human mind “can be stimulated by many things other than images—by signs and words, for example, which in no way resemble the things they signify” (AT VI, p. 112; CSM I, p. 165). Descartes reveals what appears to be a semiotic dimension of the figure-idea relationship. And this semiotic dimension has prompted numerous interpretations to account for how the figures could either induce or constitute the conditions necessary for the formation of ideas and even linguistic meaning. Scholars have read these figures as either the raw data on the basis of which the soul made a calculation or as a process of semantic signification or sign-based representation (Maull, 1978; Yolton, 1996). Others have taken the figures to be coded patterns (Morris, 1969) or even algorithms (Grosholz, 1991, p. 126–28), which requires some kind of recognition or process of conversion. Gaukroger (1995, pp. 284–87) employed a linguistic model to account for the nature of perceptual understanding because a linguistic model requires seeing no difference between sensory stimulation (signifier or figure) and perceptual understanding (signified or idea).

Gaukroger’s position to treat perceptual understanding in linguistic terms is actually quite intriguing, although it bypasses an important issue and point of criticism made by Krell (1987, p.

222), which is that Descartes’ account and some of the scholarly interpretations tend to presuppose what they do not explain, namely, in the first place “why it should be necessary to call upon either a soul or a machine to read representations engraved on a gland.” There is still, at the heart of the figure-to-idea transformation a process of reading, a translation of sorts which cannot simply be done away with, but which apparently cannot be explained. I would like to propose something quite different to account for the figure-idea relationship which takes advantage of the linguistic approach offered by Gaukroger—an approach that seeks to render indistinguishable figure and idea—but which also addresses Krell’s concern that a final explanation of how a figure is read as an idea by the soul may ultimately remain out of reach.

My account assumes Descartes’ own heavy reliance on the explanatory function of analogy quite generally as a rhetorical strategy in his natural philosophy (Galison, 1984). I propose that the figure may more productively be imagined to be a figuration—that is, a figurative inscription that only stands in for the movement between body and soul. The figures, I suggest, best function as would a figure of speech, that is, as the production of meaning which is nothing but a displacement or transferral of meaning. The figures act as a necessary circumlocution of the soul-body boundary, a metaphor that traverses the matter-mind threshold. This is admittedly a kind of interpretive circumlocution on my part, but I would argue that this is precisely the point. The figures are doubtlessly meant to be anatomical phenomena, and yet they cannot strictly be considered anatomically, since they are the very conditions of a movement from body and matter to the soul and the formation of ideas. They represent the conceptual limits of Descartes’ psychophysiology, which makes sense since they are being inscribed on the very metaphysical threshold or limit between mind and body, on the surface of an object I have attempted to describe as a quasi-fictional third term situated between different ontologies.

I would propose that we read both with and against Descartes, and consider the figures as a real anatomical occurrence, as far as Descartes imagined them to be, but also a kind of metaphor for the work of translation that they would have needed to perform in order for perceptual understanding to be possible at all. To say that the figures are performing a work specifically of translation is not without some merit, since the notion of the Latin *translatio* was a term that possessed a number of significant meanings in the mid-seventeenth century, most notably, metaphor and transfer (Vickers, 2008).<sup>44</sup> At one and the same time, *translatio* denoted the Renaissance and early modern notion of a rhetorical figure of speech (*metaphora*) (Park et al., 1984) and also a literal transfer of physical entities and conceptual ideas. When Descartes in the *Principles* defined the concept of motion “in the strict sense,” he defined it as “the transfer of one piece of matter [*translationem unius partis materiae*]” (AT VIIIa, p. 53; CSM I, p. 223) from one vicinity to another (Slowik, 1999). *Translatio* had a distinctly political meaning as well, in the sense of the transferral or transmission of power or supremacy from one dominion to another; and while the medieval and very early modern political notion of *translatio imperii*—or the continuous and uninterrupted permanence of universal governance, historically united and rooted in Roman rule (Nederman, 2009, chapter 11; Rothstein, 1990)—was no longer in historical circulation, still *translatio* did not lose its political sense. The French “translation” in the first edition of the *Dictionnaire de l’Académie française* from 1694 carried the political sense of a transferral of power or authority.

To say that the figures performed or introduced the work of translation (or *translatio*) into the overall functioning of the pineal gland means that they were successfully able to enact a transfer or

<sup>44</sup> I am grateful to Michael Wintroub for drawing my attention to the early modern significance of the notion of translation.

traversal of some sort between two separate domains (the body and the soul) but only metaphorically, in the sense of a displacement of meaning. In other words, the only way in which the figures traced on the gland could be psychophysiologicaly efficacious would be if they were *embodying metaphor itself*, materializing the fundamental *translatio* from matter to mind. This is what I meant when I wrote at the end of section 4 that the interaction of the soul and body relies on a language of fiction. The figures are efficacious only if we take them as embodying a metaphorical translation across an ontological boundary, in a way that is necessary yet also an inexplicable fiction. This is perhaps another, more productive way of thinking about what seems to be the “deeply inexplicable” (Voss, 1993, p. 134) nature of the pineal gland, even if it does not necessarily resolve that inexplicability.

It had been the objective of this paper to suggest that the pineal gland was a transitive entity. And as I suggested in sections 2 and 3, the gland exhibits traits that place it ontological somewhere “between” the body and the soul. But at the same time, the gland along with the figures traced upon it bleed into fiction—into the discursive register of translation and metaphor, the process of traversing a boundary of meaning. It may be more appropriate to say that the pineal gland and its figures were *translative* through and through: they exist ontologically somewhere between soul and body, somewhere between fiction and anatomy. But it is precisely their translative state, that they were “between,” that makes possible what no other explanation seems to account for, namely, how it was possible both to cross and yet maintain the mind-body boundary. Only the pineal gland was capable of performing the work, and embodying the state, of a material translation.

## 6. Conclusion: paradox of the pineal<sup>45</sup>

If the pineal gland is truly the privileged site of the union of the soul and body, are we then forced to admit that the union reveals something fictitious about itself, as the effect of an unimaginable translation between matter and mind? In the 1643 letter to Princess Elizabeth, with which I opened section 1, Descartes surprisingly insisted on both the union and division of the soul and the body, even though the former was recognizable only through the ordinary experience of the senses while the latter was recognizable only through philosophical reflection. But as Descartes insisted, both conditions could not be conceived at once: “It does not seem to me that the human mind is capable of forming a very distinct conception of both the distinction between the soul and the body and their union” (AT III, p. 693; CSMK, p. 227).

But even if mentally conceiving the simultaneous distinction and union of the soul and body was impossible, accepting the simultaneity would not be. The soul and the body were as much united as they were distinct, and it is precisely the pineal gland that shouldered and indeed embodied this paradoxical imperative. It is not surprising to see that, as a consequence of such an imperative, the gland lapses into kind of irresolvable or at least inexplicable state. Voss (1994, p. 299) has referred to this 1643 letter as the swan song and final instance of any possible ontological category of the human in Descartes’ writings. I would go so far as to insist on the general precariousness of the category of the human person in Descartes writings. A human person is secured by the pineal gland and its operations only at a great cost—that is, only if we take account of all the complications, fictions and translations necessary to account for that possibility.

To return to the point with which I ended section 1, any story of the historical and anthropological equivalence of the self and brain (Vidal, 2009) would need to account for the deep and troubling

non-equivalences that haunt that narrative. The Cartesian brain and the material translations taking place therein reveal some curious features of the earliest modern self-brain conflation—namely, that the brain may have been more ontologically indeterminate than we might think; and that it resolved the problem of mind and body only by displacing it through a process that was ultimately translative and metaphoric. Then again, it may be more fruitful not to think of the human in terms of the union nor distinction of the soul and body, but precisely in terms of the *problem* of that final determination. The human—if this is ultimately what motivates our interest in the soul-body union in the first place—may actually and perhaps counterintuitively be the name we simply give to the *problem* of finally determining some absolute epistemological, ontological, and political essence of the anthropos. In that case, perhaps, the pineal gland, this very strange bit of anatomy, is actually more emblematic of the human than any other organ, including the brain properly understood, could ever be.

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<sup>45</sup> This is a direct allusion to Krell’s (1987) essay, “Paradoxes of the Pineal,” on which I am drawing conceptually.

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