DESCARTES AND THE GENERATION OF THE MIND-BODY PROBLEM

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ABSTRACT

This dissertation is about René Descartes and the problem of the union between mind and body. I focus on statements from the Passions of the Soul, where Descartes claims that at conception the soul falls in love with the blood located in the heart. I attempt to understand this passage in the context of Late Scholastic and Early Modern philosophy and medicine. I conclude that the mind-body problem is in fact a problem of self love: why does the divinely created soul love this particular body?

Although Descartes eliminates substantial forms from his theory of nature, he still insists that the soul is the only substantial form in nature. Following his predecessors such as Francisco Suarez and physician Jean Fernel, Descartes believes that the soul joins with the body on the basis of certain dispositions or accommodations. Physicians such as Fernel or William Harvey believed that the body contained a divine element within it, be it a spirit or the blood itself, that worked as a hinge joining the divinely created spirit and the sexually reproduced body. Descartes believes that this disposition is the blood located in the heart.

However, Descartes theory runs aground when he asserts that this disposition is strictly mundane, featuring no divine element whatsoever, and having the same structure as other kinds of inorganic heat. Descartes believes that the nature of this heat and the movement of the blood that creates it are derived from the semens, which are themselves utterly mundane. This stands in contrast to his predecessors who believed that the divine nature of the blood was derived from the divinity of the semen, as the most divine components of the semen combined to create the heart. Because Descartes denies the involvement of any supernatural spirit or substance in the process of generation, he must assert that the body, and its dispositions, is like any other matter.

While his predecessors could coherently believe that the soul loves a human body because the
human body has a distinctly divine element, the uniformity of Cartesian nature leaves Descartes without an explanation of this union.
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Introduction

This dissertation aims to explain the nature of the problem of the union of mind and body in Descartes’ work. While nearly every text on this subject focuses on the relation of brain states to consciousness in a fully-formed human being, I locate the problem elsewhere – in Descartes’ struggles to understand generation. I begin with Descartes’ claim that the human soul is the only substantial form in nature. By looking at Descartes’ immediate predecessors, I am able to explain that the union of soul and body is neither the only nor the most fundamental problem surrounding the doctrine of substantial forms. I believe that the problem of how the form is generated – either from the parents or by God – dictates how the question of the union is framed. Because Descartes believes the soul is generated wholly by God and the body is generated wholly by the parents, Descartes must follow his predecessors in explaining how the body is ‘disposed’ to receive the soul. As Descartes explains in the Passions de l’âme and elsewhere, the primary accommodation is a kind of fuel in the heart that is responsible for the body’s vital heat. This is evident in a crucial passage that the dissertation goes on to explain in depth, which appears in Article 107 of the Passions:

Car il me semble que les premieres passion que notre ame a euës, lors qu’elle a commencé d’etre jointe à notre corps, ont deu etre, que quelquefois le sang, ou autre suc qui entroit dans le Coeur, estoit un aliment plus convenable que l’ordinaire, pour y entretenir la chaleur, qui est le principe de la vie: ce qui estoit cause que l’ame joignoit à soy de volonté cet aliment, c’est a dire, l’aymoit.

Chapters 2 and 3 analyze the features of the blood, the heart, heat, the generation of the soul, and Descartes’ notion of love, until it becomes clear why Descartes might say that the soul comes to love the blood and unite with it. The problem that emerges from this discussion is why the soul
would love this substance, when from the point of its generation the vital heat and the blood were no different from any other material that might create an identical heat.

This is admittedly not the usual terms of the debate when we address Descartes and the mind-body problem. It is commonly thought to be a problem of interaction between mind and body, and there is good historical evidence for this. However legitimate that way of thinking is, I argue that it is not the whole story. In fact, the problem of the union of mind and body is enormous. The soul, the mind, intentionality, the brain, the embryo, and the nervous system all pose innumerable questions which in the end refer to the whole of theology, phenomenology, ontology, anatomy, embryology, and physiology. Perhaps unwittingly, we often break up the problem and focus on the specifics of intentionality and neuroscience, where the problem of intentionality and phenomenal experience is left to be solved by neuroscience. Yet this practice comes with an enormous sacrifice: in breaking the problem up into these details we sacrifice our capacity to address the problem as a whole. The role of theology, embryology, and anthropology are obscured in favor of an endless debate over the facts of neuroscience. While this line of research is by no means illegitimate, it is a detail whose conceptual development has far outstripped any other aspect of the problem, including a properly philosophical articulation of the problem itself. However, at the moment, I am in no position to support this criticism with what is a badly needed synthesis of these different strands of the problem, which I do hope to work out in the future. In focusing on the role of generation in Descartes I hope to remind philosophy of the many aspects of the mind-body problem and how difficult it is to express it en bloc. However, in its partiality, this dissertation also exhibits my intention to mark off the phases of a broader inquiry of the whole problem.
The topic of Descartes and the mind-body problem is hardly new – it is probably the most well-worn discourse in philosophy today. However, this work is primarily a critique of the common approach that takes the problem for granted and prioritizes solutions. It should be clear that this essay is not an attempt to ‘solve’ the problem as it is commonly understood in Descartes or the philosophy of mind. Rather, the sole aim is to restore the problem to its proper philosophical status through a reading of Descartes in his historical context. As I make clear by the Fourth Chapter, this approach is in many ways radically different from other studies and results in a very different outlook on the problem. However, this approach to history and Descartes in particular is far from novel, for great interpretative work has been done, particularly in situating Descartes in his socio-historical context. Most notable in this regard is the work of Etienne Gilson whose scholarship in the mid-20th century continues to yield new projects in the field. His work sets a benchmark in terms of its scholarly and archival rigor as he unearthed many historical influences otherwise lost and forgotten by Descartes studies.

This essay very much follows in his path in that it attempts to locate the problems Descartes was struggling with in its Medieval and Scholastic context. Most importantly, Gilson demonstrates the value of archival work vis à vis Descartes. His Études from 1951 is one of the first extensive discussions of Descartes in relation to physiologists such as Fernel and Harvey, who are central to this essay. Following Gilson, this essay is primary concerned with understanding the mind-body problem in Descartes by focusing on Descartes’ own sources as much as possible. This is a comparative approach to Descartes insofar as most of the essay attempts to understand Descartes in light of his immediate predecessors in philosophy, theology, and medicine. That is not to say that Descartes is reducible to Scholastic philosophy, or that his

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mind-body problem is ‘just’ Harvey’s or Fernel’s or Suarez’s. Rather, comparisons are made to highlight what is essential in Descartes’ thinking and to demonstrate the originality of his thinking on the problem. This approach has spread to many areas of Descartes scholarship, yet for some reason the mind-body problem is never deemed worthy of such a treatment. For this reason it seems suspicious that, in spite of its banality, we may not have a solid grip on what the mind-body problem is in Descartes. As Gilson writes, “Is it possible to understand a philosopher well if we ignore a doctrine that the philosopher had thought about so much that he elaborated his own theory?”2 This project aims to accomplish just that, and in the process rehabilitate the mind-body problem such that it rests on a more concrete historical foundation.

The aim of the first chapter is twofold: to establish the relation of forms to matter in the late Scholastic period, and to articulate Descartes’ critique of Scholastic physics. In surveying the landscape of Scholastic physics, I pay particularly close attention to Francisco Suarez’s Fifteenth Disputation on formal causes. Because Suarez understands the relation of substantial forms to matter through the analogy of the relation of the rational soul to the body, Suarez provides a clear example of what Descartes means when he claims that Scholastics see all of nature in terms of “little souls attached to bodies.” But Suarez is pertinent not only because he is most likely the figure that Descartes takes aim at in his critique of substantial forms; in dealing with the union of soul to body, Suarez is especially attentive to the question of the generation of form and whether or not the form is educed from matter or created ex nihilo by God. His verdict on this question has critical implications for his understanding of the union of soul and body, and thus Suarez provides a clear introduction to the relationship between the question of generation and the mind-body problem. Once Suarez’s views on the matter have been made sufficiently

clear, I then proceed to Descartes’ critique of this doctrine, which is implicit in his *Meditations*, but more explicit in his correspondence and work on physics. In recounting his critique, I show how Descartes eliminates the idea of substantial forms from Nature so that he can then establish a physics that deals with Nature strictly in terms of particles and motion. Moreover, we must comprehend just what Descartes understands by ‘substantial form’, since the one substantial form he does not eliminate is precisely the topic of this dissertation: the soul and its union with the body.

Throughout my exegesis I am particularly concerned with the problems generation poses for the doctrine of substantial forms. Of course, we can speak of a qualified generation, meaning that the essence of a being is modified. But we can also speak of generation in an absolute sense, which is to say that a wholly new being emerges. The latter problem of substantial generation poses unique concerns for the Scholastics and I go about tracing this through Suarez’s *Fifteenth Disputation*. In Suarez’s work, the key issue is whether the form is generated out of matter, or educed, or if it is produced *ex nihilo* by God. Suarez is willing to concede that somehow all forms are inherent in matter and are then educed from it, but one substantial form is produced, or created *ex nihlo* by God, and since it is not educed from matter it must be united to the body *after* its generation. I then draw out the implications of this on the question of the union of form and matter. Ultimately, we come to see that if the form is *produced*, it must then be united by a ‘third thing’, or a ‘disposition’. Yet if the form is *educated*, its union is immediate insofar as it is always already tightly enmeshed in the matter it emerged from. As only the rational soul is produced, the human body will thereby need certain dispositions to accommodate the soul. This is the basic framework of the Cartesian mind-body problem, as I understand it, and Descartes will be faced with many of these same issues.
The second chapter addresses the specifics of the physiology of these dispositions. According to Scholastic philosophy, if form and matter are to be united to create a human being, then matter must be endowed with certain ‘dispositions’ or ‘accommodations’. As the first chapter demonstrates, this necessity is a direct result of the fact that the soul is generated from God while the body is created by the parents. Though Suarez says very little about the precise nature of these dispositions, the medical community of the time was heavily involved in investigating and elucidating their nature. Anyone who reads Descartes’ own *Traité de l’homme* would find a virtual catalogue of dispositions. However, Descartes was not without precedent in his investigation of the primary dispositions responsible for welcoming the soul into the body. In his publications and correspondence he favorably mentions two physiologists whose work he drew upon in this regard: Jean Fernel and William Harvey. I turn to the work of these two figures in order to gain a more precise account of what a disposition is. It will become clear that these thinkers put the heat of the heart above all other bodily functions in terms of its role in accommodating the divinely created soul. However, what is not so clear is just what the nature of this heat is, how it relates to the soul, and what role the heart plays in maintaining it. Is the essence of the vital heat a divine spirit? Or is the blood itself supernatural? Or is this heat a peculiar *feu sans lumière*?

This chapter attempts to clarify these questions and survey various attempts to answer them through a close look at the medical literature of the time. The chapter breaks into three sections, the first of which provides an extensive exegesis on Fernel’s thoughts on the soul-body union. Working through his texts, we come to see that Fernel follows Suarez in stating that the rational soul alone is generated from a divine source. Yet Fernel gives much more detail and context to the union by detailing the role of spirit which he believes resides in the body as the
‘third term’ uniting soul and body. Spirit has a Janus face in that it not only resides in the semen, and is thus educed, but it also has a ‘divine quality’ and thus can relate to the realm of the soul. Spirit ultimately comes to reside in the heart is the primary accommodation for the soul, but it is clear that spirit plays a key role in the generation of the body - a point that I allude to here and treat comprehensively in the third chapter.

When Descartes discusses spirits, the blood, and the functioning of the heart, it is almost always with the work of William Harvey in mind. The second section of this chapter takes a closer look at Harvey’s account of the circulatory system and animal heat, emphasizing the role of substantial forms and innate tendencies in his theories. While Harvey believes that the heart functions like a pump sending the blood out into the body, the blood only returns on the basis of an innate centrifugal force which draws it back toward the heart. Moreover, while Harvey believes that there are no divine spirits in the body, refuting Fernel explicitly, he does assign the blood all of the intermediary functions that Fernel had assigned to spirit. Thus, on Harvey’s account, it is the divinity of the blood that accommodates the soul into the body. These and other elements of Scholastic physics is what Descartes will take aim at in his critique of Harvey.

Turning to Descartes, I focus on his claim that the primary aspect of the heart is a vital heat that resides in the walls of the flesh, and it is through this heat that the heart warms the blood that passes through it and is pumped to the rest of the body. The heart therefore heats the entire body through the intermediary of the blood. Both Descartes and Harvey agree on this point, and in doing so they both see themselves following the Aristotelian tradition. However, while Harvey follows Aristotle’s *De Respiratione* almost point by point on this matter, Descartes insists that this heat of the heart is due to strictly mechanical causes. In so doing, Descartes will introduce what he calls a ‘feu sans lumière’ that is responsible for heating the heart and in turn
the body. This final section of the chapter takes up the task of demonstrating how Descartes believes this heat is produced strictly through the movement of ‘first element’ particles through the pores of the walls of the heart. This heat is nothing other than a kind of fermentation, the sort of which we can find in inorganic processes such as wine production, or when heat is produced through wet hay. Thus, there is nothing divine about the heat of the heart as Descartes conceives it, and yet he still believes that this heat and the blood that produces it are the primary dispositions permitting the soul to unite with the body. In sum, my aim is to highlight the similarities and differences between Descartes and his immediate predecessors on this important point. They agree that in order for the body to accommodate the soul certain dispositions are required, be it a vital spirit or the blood itself. However, while Fernel and Harvey think that the spirit or blood plays this role on account of its dual nature, Descartes insists that vital heat and the blood are merely first element particles, and yet they still have a unique capacity to relate to the divinely created soul.

This insistence is crucial when we focus on the union of mind and body in Descartes. The third chapter explains Descarte’s own theory of how the body is generated, how the soul is generated, and how the union is generated. The necessity of these three moments is made clear in my reading of Suarez’s Fifteenth Disputation. If the form is educed from matter, then the union is solved, for a form that emerges from matter is already tightly enmeshed. The problem in this case is how the form ever came to distinguish itself. Yet for Descartes and others, the rational soul is not generated in this way. As Suarez makes clear, the rational soul alone is produced by God. As such, its distinction from the body is clear, but its union is in doubt. The nature of the soul’s union with the heat remains obscure until I explain the generation of this disposition in the
heart, the generation of the soul, and the generation of the union such that they constitute “one single thing”.

The first section on the generation of the body begins by looking back to Descartes’ immediate predecessors, most notably Fabricius, Harvey, and Fernel. These thinkers all agree with Aristotle that the generation of the body is a goal directed process, and that spirit plays some essential role in the fertilization of the egg. Descartes will explain this process without any appeal to final causes, relying strictly on an investigation into the movement of particles. Descartes’ most extensive treatment of this issue comes in his *Description of the Human Body*, where an account of generation is presented as a digression on the topic of nutrition. The basic concepts that Descartes employs in the *Description* were all explained in his *Principles*; no new conceptual apparatus beyond the motion of particles are employed to grasp the phenomenon of organic generation. I trace Descartes’ explanation of the formation of the heart out of the heat created by the mixing of male and female semen. Using Fabricius and Fernel as points of contrast, I emphasize how Descartes’ explanation of the formation of the fetus, and the heart in particular, comes about through the movement of first element particles, a phenomenon we might find in fermenting wine or wet hay. I explain how the male and female semen combines to create heat, how heat creates the heart, why the heart is the first organ formed, and how it serves as the source of heat for the animal, be it a fetus, an infant or an adult. The heart emerges from this heat and the heat in turn takes up its residence in the heart. This heat, the principle of life, is always of the same mundane nature be it in generation or the heartbeat, and Descartes even invokes the same metaphors to explain the heat that propels generation as well as that which resides in the fully formed heart.
Descartes is at once very close to and very distant from what Fernel had written on these issues. As is the case in Descartes, it is not by accident that Fernel believes the heart is the site of vital heat, maintaining the life of the body. His position begins with the assertion that spirit is responsible for all of generation: “[T]his spirit, the regulator of heat and all the faculties and the originator of procreation, gathers into the center of the semen. It does not vanish, or fly off from the semen, although many people take Aristotle this way, but continues in it as the craftsman fashioning all the parts, is utterly and fundamentally imbedded in them, and becomes their original nature.” Yet, even though the spirit and the vital heat it carries are embedded in the whole body, it is most concentrated in the heart. This is due to the fact that the semen is not uniform, but rather the spirit is concentrated in the ‘center’; each organ that develops out of the semen takes on the particular character of that part which it develops out of. As Fernel explains, “First of all, swelling with much spirit, [the semen] spreads itself out, and pervading everything it separates off the different parts in the semen (which looks simple and uniform, yet is not so), the hot from the cold, the thin from the thick and earthy, so that individual parts end up adopting their own nature, and are assembled for the fashioning of the parts from which in the past they withdrew.” Unsurprisingly, the heart develops out of the hottest, most spirituous, and most divine bit of semen, allowing it to take on that character. This concentration of spirit and heat remains with the heart throughout its life, and as with Descartes the heart serves as its residence. As we know, in Fernel’s work this is the primary disposition at play in attracting the rational soul to come down from the heavens and join with the human body. The possibility of this union is derived from not the nature of the heart, but the semen that forms the heart out of its dense accumulation of divine spirit. Hence, the primary accommodation for the reception of the rational soul is founded upon this specific account of the semen.
This fact is not lost on Descartes, as he adopts a very similar position. And yet the mechanistic approach does not permit the actions of divine spirit. In its place, the formation of the heart and its resident heat are composed strictly of the motions of first element particles. For Descartes the semen is material, and so is its heat which drives the process of generation. Accordingly, the heat of the heart is no more and no less material, as it is the first product of the movement of the semen’s particles. We find Descartes emphasizing this position in the Description, such as when he claims, “And I do not know of any fire or heat in the heart than this agitation of the particles of the blood…” or “this movement of the diastole has been caused from the beginning by heat, or by the action of fire, which, following what I explained in my Principles, is not able to consist of anything other than the first Element.” This strictly mundane process must be contrasted to what we see in Fernel, or even Fabricius. In both thinkers, though most explicitly in Fernel, the process of generation simply cannot be accomplished without the aid of some extra-mundane element. Fernel understands that the semen itself must bridge the gap between this world of elemental particles and the other world that the rational soul originates from. Although it is true that the heart’s heat is the disposition that accommodates the soul, as we saw in Chapter 2, this heat and its dual nature are owed to a concentration of spirit in the semen that the heart develops from.

In contrast, Descartes reduces the heat to a byproduct of matter and motion, and thus the heat produced through the mixture of male and female semen is not divine or spirituous at all. It just is the same heat found in other inorganic processes such as the fermentation of wine or the warmth of wet hay. That is, this heat is not only not divine, having no connection to the realm of the soul, it cannot even be said to be specifically organic. Nevertheless, Descartes believes that this is the heat that sparks animal generation, setting the particles in motion that soon begin to
form the heart. As we have seen, this heat created through the mixture of male and semen forms the heart and continues to reside there throughout the life of the organism. And just as the divine spirits produce a supernatural kind of heat to accommodate the rational soul in Fernel, Descartes tries to replace this apparatus with a mechanical theory of generation and vital heat. As we shall see after our investigation into the question of love, this becomes the crux of the problem.

The second section of Chapter 3 investigates the generation of the soul, paying particularly close attention to the proof that God created the soul in the latter part of the Third Meditation. I give a detailed explication of this proof, focusing on God’s function as the creator and sustainer of my existence, understood as a thinking thing. Of course, Descartes is explicit in these pages that the parents do not create the mind, and therefore the mind is not differentiated on the basis of bodily characteristics. God’s authorship of the soul does establish the difference between humans and animals, but it does not establish any difference between humans. This is a direct consequence of God’s generation of the mind, a point not lost on other modern thinkers who investigate human diversity through the Cartesian paradigm. This is a point I return to at the conclusion of the essay, but suffice it to say, the mind’s divine ancestry makes body types irrelevant as an indicator of mental capacities. This point was noted not just by feminists, but also anthropologists, physionomists, and philosophers.

The third and final section of this chapter focuses on the generation of the union of soul and body. As Descartes writes in several places but most notably in Article 107 of the Passions, this union is a bond of love. A thorough investigation of just what this means is the task of this section. The section begins by exploring Descartes’ explanation of the concept of love both in the Passions as well as in his correspondence. In his explanation, Descartes begins with a distinction between love that is “purely intellectual or reasonable” and that which is a passion – a
Purely intellectual love is a “pensée raisonable” and concerns only the soul, without the body, whereby the soul both knows and wills a good, and it is the movement of the will that accompanies this knowledge that constitutes what Descartes calls ‘joy’. This feeling is produced in and of the soul itself, independent of the body, since it concerns only a consideration of itself with this good. As Descartes explains, joy is the first experience of the soul, as it is drawn to the dispositions and accommodations offered by the body: “because it is not believable that the soul had been placed in the body if not when the body had been well disposed, and that when it is well disposed in this way, this naturally gives us joy.” That is to say, when the body is merely present, the soul experiences joy in the mere consideration of its presence. This ‘consideration’ is significant in that it helps us understand how Descartes thinks the initial union of soul and body. Descartes seems to think that the mind thinks the heat of the heart, grasping it in the intellect, and this perception is the precondition for the soul loving the vital heat.

This theory of love is not without precedent, as Ficino’s Commentary on Plato’s Symposium on Love employs a similar framework to explain the union of soul and body. In this work, Ficino draws on Plato’s characterization of Eros as a daemon able to mediate between the divine and mundane realms. In his unique interpretation, love is the crucial bond between soul and body in that the soul, encased in spirit, descends from the heavens, imprints its image on a body and then upon recognizing its own image, the soul joins itself to that object in a bond of love. The role of spirit is critical to this discussion as it is the physiological correlate of love, both of which serve as the ‘third term’ or intermediary between the divine soul and the mundane body.

Descartes shares much of Ficino’s thinking as will fit in his mechanist paradigm. Yet, as we have seen in Descartes’ work on the heart and his reconception of the semen, spirit has lost
this intermediate position. Thus Descartes is faced with the problem of how the soul comes to love this blood, this heat, this heart, and ultimately, this body. As I explain, this was not a problem for Fernel and others because this act of love had a physiological correlate – divine spirit inherited from the semen – that made the heat of the heart distinct from elemental heat. Descartes seems unable to explain why the soul should love the blood when it has no divine element, and it is this problem that lies at the heart of his mind-body problem.

In sum, by the end of the third chapter, I have made the following claims: The Scholastics saw themselves following Aristotle in studying nature in terms of substantial forms. Insofar as substantial forms govern the behavior of bodies, this approach focuses on how and why certain changes occur in nature. No change is more curious than the generation of a completely new form. In resolving the issues surrounding substantial generation Suarez was led to posit two types of generation and two corresponding types of union between form and matter. Our concern, the union of the rational soul to the human body entails certain dispositions or accommodations so that the material body can serve as a welcoming abode for the divinely produced soul. Fernel, following tradition, had thought that the primary disposition was a certain vital spirit which bore within it an innate heat. This spirit, with its material and divine aspects, drove the process of generation, ultimately concentrating itself in the heart. Harvey, who thought that spirits could not be empirically verified, gave this same role to the blood. Descartes accepts much of this framework, if we understand that in the broadest sense. He agrees that the soul is produced by God *ex nihilo*, out of his infinite power. The soul, produced by God, sustained by God, and bearing his likeness, joins with the earthly body by falling in love with a certain fuel in the heat of the heart. Eschewing Fernel and following Harvey, Descartes believes this liquid to be the blood, which heats the heart through a special process of fermentation. As with Fernel, the
warm nature of the heart derives directly from the process of insemination. In Fernel’s thought, this heat forms on account of a concentration of spirit in the semen that goes on to form the heart. Thus, Fernel can claim that the soul joins with the heart because the heart’s heat has this dual nature, both divine and mundane. However, in Descartes’ mechanical physics of the body, he eliminates any divine material from the semen; the semen is composed only of particles. Although these particles are mainly the fiery particles of the first element, they have no dual nature. Hence for Descartes, the semen, and in turn the feu sans lumière of the heart must be identical to other elemental fires found in inorganic material such as wine or hay.

Meanwhile, the soul is thought to arrive from God’s hands and ‘love’ this elemental heat. This too has its precedent in Scholastic writing, namely in Ficino’s commentary on the Symposium. Love is the correlate of spirit insofar as love is a daemon responsible for transporting the soul to the body, uniting them. But this love cannot be accomplished without Ficino presuming a certain divine spirit that comes to reside with the seed, allowing the soul to join the body. However, in Descartes’ overhaul of Scholastic physiology, he has lost the physiological correlate of love. There is no longer a divine spirit to differentiate this body as the object of love. And although the soul may have the power to ‘capture’ the body, there is no explanation as to why this heat, this fuel, and this blood is the object of its love. In eliminating the ‘third term’ from the body, a direct result of his reconception of insemination, Descartes posits love as an intermediary without any associate on the side of the body. Therefore, the soul may love, but it is lost in what it loves. Why does the soul not love hay or wine? Why does it love this body – my body? The mind-body problem is not so much the problem of love as it is the problem of self-love. How do I come to love myself when the body, its heat, and its blood emerged out of particles that are absolutely this-wordly?
Finally, the essay concludes with a general discussion of the significance of problems for philosophy itself. It has been taken for granted for at least the past 60 years that the mind-body problem is the problem of interaction. This is the common sense problem of how the brain interacts with the mind, and it is a discussion we are familiar with since our first introduction to philosophy. Unfortunately, the legitimacy and historical foundation of this problem consistently eludes critique in favor of philosophers’ obsessive concern with finding a solution. However, certain historians of science have taught us the crucial role problems play in the gathering of scientific and historical facts. We must remind ourselves of the philosophical preeminence of the problem over the solution, and in so doing illuminate a certain path of research that this project will develop along.

Works Cited


Chapter 1

Descartes’ Critique of Scholastic Physics

The aim of this chapter is twofold: to establish the relation of forms to matter in the late Scholastic period, and to articulate Descartes’ critique of Scholastic physics. In surveying the landscape of Scholastic physics, we will pay particularly close attention to Francisco Suarez’s *Fifteenth Disputation* on formal causes. Because Suarez understands the relation of substantial forms to matter through the analogy of the relation of the rational soul to the body, we find in Suarez a clear example of what Descartes means when he claims that Scholastics see all of nature in terms of “little souls attached to bodies.” But Suarez is pertinent not only because he is most likely the figure that Descartes takes aim at in his critique of substantial forms; in dealing with the union of soul to body, Suarez is especially attentive to the question of the generation of form and whether or not the form is educed from matter or created *ex nihilo* by God. His verdict on this question has critical implications for his understanding of the union of soul and body, and thus Suarez provides a clear introduction to the relationship between the question of generation and the mind-body problem. Once Suarez’s views on the matter have been made sufficiently clear, I then proceed to Descartes’ critique of this doctrine, which is implicit in his *Meditations*, but more explicit in his correspondence and work on physics. In recounting his critique, I show how Descartes eliminates the idea of substantial forms from Nature so that he can then establish a physics that deals with Nature strictly in terms of particles and motion. Moreover, we must comprehend just what Descartes understands by ‘substantial form’, since the one substantial form he does not eliminate is precisely the topic of this dissertation: the soul and its union with the body.
The Role of Substantial Forms in Scholastic Physics

The very opening sentence of Descartes’ First Meditation reads as follows:

It is now some years since I detected how many were the false beliefs that I had from my earliest youth admitted as true, and how doubtful was everything I had constructed on this basis; and from that time I was convinced that I must once and for all seriously undertake to rid myself of all the opinions which I had formerly accepted, and commence to build anew from the foundation, if I wanted to establish any firm and permanent structure in the sciences.\(^3\)

The importance of critiquing and liberating ourselves from the prejudices we have held since our infancy is restated several times in Descartes’ work, most notably in Part II of *The Principles of Philosophy*, where Descartes entitles section 71, “That the first and principle cause of our errors are the prejudices of our infancy.” Here he goes on to emphasize the imperative of freeing ourselves from these prejudices in order to “be in a position to reject all the opinions that we have received in the past from our birth” and it is only on the basis of this critique that we will then be able to “seriously attend to the study of philosophy and the search for all the truths that we are capable of knowing.”\(^4\) These statements help us to understand in part why philosophy must begin with the method of hyperbolic doubt, since we can only liberate ourselves from the errors of youth by submitting all our previous beliefs to doubt. However, Descartes does not begin the First Meditation by enumerating and critiquing the specific beliefs from his youth, but rather he famously begins with a critique of the knowledge he believes himself to have received from the senses. As Martial Gueroult explains, “The preparation for this [hyperbolic] doubt consists, not in the censure of various opinions, but in a critique of their principle, a principle that

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3 AT VII, 16; IX, 12
4 AT IX, 61
will involve them all in its ruin, and the principle is that knowledge comes from the senses.”

Thus it may seem strange that Descartes begins the First Meditation by calling for a critique of the prejudices acquired in our infancy, but he then goes on to direct his method of doubt primarily at the knowledge gained from the senses. Solving this puzzle is essential to Descartes’ critique of Scholastic physics, as I will demonstrate that for Descartes the liberation from the prejudices of our infancy and the hyperbolic doubt of the knowledge gained from the senses are in fact two sides of the same coin. That is, the critique of both the senses and the prejudices of infancy merge in his rejection of the Scholastic doctrine of substantial forms. It is on the basis of this critique that we must pose the others, as it is the Scholastic idea of substantial forms that underlies both the errors acquired in our youth and the false knowledge gained from the senses.

What is a substantial form? Historically, this is an idea attributed to Aristotle, and although we can easily see how it is inspired by Aristotle’s metaphysics, the words ‘substantial form’ never actually appear in Aristotle’s writing. Nevertheless, the notion of a substantial form functions as an explanation for the determination of the material we see around us and can examine. That is, it is clear that we can experience many things composed of matter, but the reality of these things as definite things is derived not from the material of which they are composed but rather of their form. The word that Aristotle used to name an individual thing as form was ousia, and it is only ousia that makes something a ‘this’. However, the substantial form of a thing not only allows us to delineate matter as a certain ‘this’, it is also invoked to explain the basic behavior of something. This is because the behavior of a body is not due to the matter it

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is composed of, but rather what type of form makes that matter a plant or a horse or a man. In the period in which Descartes finds himself, the theory that each object in Nature must be known on the basis of a corresponding substantial form is found in one way or another in all the major thinkers of the time. The Coimbrian fathers provide a good example of this paradigm when they write, “There are individual and particular behaviors appropriate to each individual thing, as reasoning is to a human being, neighing to a horse, heating to a fire, and so on. But these behaviors do not arise from matter which, as shown above has no power to bring about anything. They must arise from substantial form”\(^7\).

Thus, when Scholastics study nature it is not a matter of definitions or the study of material causes; it is the study of ‘behaviors’. That is, when we look at nature, we see more than just definite things, as the quote above from the Coimbrians indicates: we want to explain the behavior of things. Why do stones fall downward? Why does fire rise? How does water evaporate? All of these behaviors concern not just definite things, but change and movement. That determinate things change and move is a basic and undeniable aspect of our experience of nature. This is implicit in a basic distinction in Aristotle’s thinking between those things that are generated, move, and disintegrate and beings that are permanent and incorruptible:

> Among those beings constituted by nature, some are ungenerated and imperishable throughout all eternity, while others partake of generation and perishing. Yet it has turned out that our studies of the former, though they are valuable and divine, are fewer (for as regards both those things on the basis of which one could examine them and these things about them which we long to know, the perceptual phenomena are altogether few). We are, however, much better provided in relation to knowledge about the perishable plants and animals, because we live among them. For anyone wishing to labor sufficiently can grasp many things about each kind.\(^8\)

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8 Aristotle, PA 644b22-31
The nature of an object’s changes is the focus of the study of nature, a nature that is rooted in an object’s particular substantial form. The substantial form bears all of the accidents that a thing acquires and loses over time, and in so doing it provides a link between the essence of the thing, which is stable and unchanging, and its accidental properties, which are constantly changing and in motion. As Helen Hattab points out, in this way the substantial form provides a crucial link between the unchanging realm of metaphysics and the transient realm of physics.\footnote{Hattab, Hellen. \textit{Descartes on Forms and Mechanisms}. Cambridge university Press: New York. 2009. p.2}

When we understand the study of nature in the Scholastic sense, as the study of particular behaviors attributed to substantial form, we must understand that this is not quite the way we understand physics today. Opening a physics textbook today, we might be greeted by something like the following: “Physics deals with quantities that can be measured. Thus you won’t find concepts such as honesty, love, and courage as primary topics of discussions in a physics book. As you proceed through your studies of physics you will find that every one of the measurable quantities that is discussed can be specified in terms of four basic dimensions: mass, length, time, and electrical charge.”\footnote{Basic Physics: A Self-Teaching Guide. Karl F. Kuhn. John Wiley & Sons. New York 1996. p.1} That is, we are met with a basic ensemble of laws and mathematical formulae that constitute something called ‘nature’. But as the Coimbrians and other Scholastics would have it, the object of physics is in fact the object of movement or change, and not just, say, what rate something falls at, but rather \textit{how} and \textit{why} it falls. This is the realm of substantial forms.

Not all changes are of the same quality. While it is true that the most common change comes in the form of a substance taking on new properties, the most striking changes come when a new being is formed that did not exist before. That is, over the course of our lives we may undergo many changes, such as when I learn to play the piano, and become ‘musical’. But then I
may develop arthritis and lose this ability. These changes are observed on a moment to moment basis. The generation of these properties is a qualified generation in the sense that nothing came to be in any absolute sense: before I learned to play the piano, I was a being, but I was not such and such type of being. This type of change is a modification of my essence. This stands in contrast to when I became a human being in an absolute sense; that is, when I was not and then came to be. With this sort of change, it is not merely a being that changes place without its appearance changing or a substance changing appearance without its essence being effected, it the emergence of a completely new essence. This is the type of change that we call ‘birth’, but that the Latin language calls “natio”: a word that must be heard in its fundamental etymological connection to “naturalis.” In the work of Scholastics such as Suarez or Aquinas, this is known as ‘substantial generation’, and it is what Aristotle intends when he writes, “For nature is an origin more than matter.”\(^{11}\) The study of nature is not the study of material causes but rather the study of change, motion, and most importantly, substantial generation.\(^{12}\) Thus, the study of nature as the study of movement and change will give pride of place to the question of generation, and in many Scholastic texts on substantial forms we find some of the most rigorous thinking on that topic.

Substantial Form, Birth, and the Union of Soul and Body in Suarez’s Fifteenth Disputation

\(^{11}\) Aristotle, PA, 642a16

Francisco Suarez, a Jesuit philosopher who perhaps authored the textbooks Descartes used as a young student in the Jesuit school at La Flèche, was one of the first Scholastic thinkers to write a systematic presentation of metaphysics that was not a commentary on Aristotle. His *Fifteenth Disputation* offers one of the clearest and most rigorous treatments of the doctrine of substantial forms, their relationship to matter, as well as a systematic recounting and rebuttal of the criticisms of the time. In looking closely at this text, we will come to see just how crucial the question of generation is to substantial forms, as well as how thoroughly the union of form and matter is determined by how generation is conceived.

Suarez defines substantial form as “a simple and incomplete substance which, as the act of matter, constitutes with it the essence of composite substance.”¹³ Yet this definition does not come until the fifth section. It would seem customary that a text devoted to the question of substantial forms might begin with a definition of the term at issue, but Suarez feels he cannot begin in this fashion because we cannot define the term until we know that substantial forms exist in nature. We cannot know that they exist because they are not observable entities, and accordingly they have to be inferred indirectly. Thus, the first four sections, a large part of the text, is devoted to supporting this inference, and only once he has demonstrated their existence does he go on to discuss the nature of its relationship to matter.

In the opening sections of the disputation, we encounter a number of arguments both for and against the existence of substantial forms. Suarez provides five a posteriori arguments for the existence of substantial forms. The first argument, and the most relevant to Descartes’ critique, is Suarez’s assertion that human beings are constituted by matter and a substantial form, and so too

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by analogy are other material objects in nature. This argument appears in a chapter aptly titled, “The Existence of Other Substantial Forms Can be Inferred from the Nature of the Rational Soul” where Suarez begins by writing, “The first argument for the existence of substantial forms is that a human being consists of a substantial form as an intrinsic cause; therefore all other natural things do.”\textsuperscript{14} This is an argument that Suarez draws from his \textit{Second Disputation} and is based on the fact that the soul is immortal. As an immortal substance, the soul can exist apart from the body, but when it informs the body it serves as the principle of corporeal life. That we can infer other substantial forms from this begins with the fact that again, Suarez sees nature as fundamentally the realm of change: “The inference drawn from the substantiality of the human soul is indeed proven by assuming the discussion is about natural things which are subject to generation and corruption. For, in this respect, these things belong to the same order as human beings, and transformations and changes can occur between them.”\textsuperscript{15} If human beings are composed of matter, then they must need some active principle to animate that material and define its behavior. But when the human being dies and the soul departs, there is still \textit{something} there, namely a corpse. In order for that material to be a definite thing and not just indeterminate prime matter, it must be inhabited by another substantial form, and hence we arrive at a non-living, non-human thing that is composed of form and matter. The only difference is that the cadaver does not have the form of an animated human, rather it has the form of a cadaver, and by analogy, horses, and plants, and stones have the substantial form that is peculiar to them.

As we shall see, it is this understanding of substantial forms that recognizes all the beings and movements of nature on analogy with the rational soul that Descartes points to in his criticism. But before we turn to Descartes’ criticism, we must look more closely at the role of

\textsuperscript{14} Ibid, 20
\textsuperscript{15} Ibid, 21
generation and corruption in Suarez’s analysis. Just as the proof of substantial forms rests in large part on the bare fact of generation and corruption, so too does the most serious objection to them. For Suarez, this objection is aimed at the problem of substantial generation. He presents the problem in the form of a dilemma that begins with the fact that if substantial forms exist, then they come to be in one of either two ways: either through creation, or not through creation. They cannot come to be through creation *ex nihilo*, since this would require a miracle of God every time a new being emerged in nature. If form were something before its generation, it could be nothing other than a substantial form. But then, if a substantial form already existed, then it would have to exist simultaneously with another substantial form, and one being would have to incorporate more than one form.

Before Suarez can resolve this, he must navigate a complicated proof regarding the origin of substantial forms. According to Suarez, when we ask whether there are substantial forms in things, we must first ask how something can come to be out of nothing. That is, not just how can any change occur, but how can this particular change occur whereby a completely new form is generated and united with matter. If he cannot adequately solve the problem of how substantial forms ever emerge in nature to begin with, then Suarez concedes that he cannot reasonably hold the doctrine of substantial forms.

As the original dilemma is posed, if the form is not created *ex nihilo*, then it must pre-exist in some way, either merely as a part or as a whole. On the question of preexistence, Suarez writes,

> The first opinion is that all forms actually exist in matter, but as a whole and complete, because those who hold this opinion see that their whole and complete existence destroys true generation and corruption of things and involves a manifest contradiction of things since these forms are incompatible with one another and since the same argument holds for accidental forms which are at times properly contrary to one another. But these philosophers say that form actually exists in matter according to an inchoate state.16

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16 Ibid, 45
However, if the form does exist in an inchoate state is this a material state? Is it a pre-existing substance within another substance or is it an accident that inheres in another substance? It cannot pre-exist as a substantial form because then there would have to be a complete being always already within each of us, and a complete being with that complete being, and so on. Suarez finds this absurd, since if the substantial form pre-existed entirely in matter, then “an infinite number of forms would pre-exist in matter,” and “nothing new would come into being; it would only seem to do so.” If the form cannot pre-exist as such, can it pre-exist as an accident? Suarez denies this possibility as well because an accident is simply not a form, but rather something intrinsic to matter, and thus the substantial form seems to emerge out of nothing. As Suarez writes, “even supposing the accident pre-existed, that would not avoid the problem that the whole reality of the form would come to be out of nothing because an accident is not anything belonging to the substantial form.” Thus, the possibilities of a substantial form pre-existing in matter seem to be foreclosed, which leaves Suarez to negotiate the other horn of the dilemma, which states that no part of the substantial form pre-exists. However, he immediately concludes that the possibility of a form coming to be out of nothing is held as “absurd and exceeds the power of natural agents.”

Ultimately, Suarez will solve this dilemma by conditionally choosing both horns: one type of substantial form is created ex nihilo by God, the rational soul, while all others are educed from matter. Accordingly, there are two types of substantial forms: “Some are spiritual, and independent of matter,” while “other forms are material and so inherent in matter that they depend on it in their being and their coming to be.” And thus, as one may expect, the analogy

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17 Ibid, 18
18 Ibid, 46
19 Ibid, 19
20 Ibid, 51
between the rational soul and other substantial forms is never complete, as only the rational soul is independent of matter. According to their function they might be analogous, but concerning the question of their origin they are completely dissimilar.

In the case of the rational soul, Suarez is willing to concede what he had previously deemed absurd, namely that one form can come to be out of nothing: “Only human souls are of the first group, for we are dealing solely with informing forms, and concerning these one must concede the inferred conclusion in the difficulty touched on, namely, that they come to be out of nothing out of true creation.”²¹ By ‘true creation’, Suarez means “to be created out of nothing”, which is to say, created by God. Accordingly, Suarez is willing to concede that somehow all forms are inherent in matter and are then educed from it, but one substantial form is produced, or created ex nihlo by God, and since it is not educed from matter it must be united to the body after its generation. As Suarez makes clear, “For the rational soul comes to be in itself, at least by priority of nature, and receives its own being as independent of matter, and afterward, it is united to matter by another action by which the whole composite is generated.” Accordingly, in the case of the rational soul, Suarez admits three acts of generation in every ensouled human being: the generation of the substantial form through a miracle of God, the sexual generation of the body, and finally the generation of the union mentioned above.

This stands in contrast to all other forms of nature in which the substantial form is generated through matter. In contrast to a strict reading of prime matter in the tradition of Aristotle, Suarez conceives matter as an active cause in nature that can operate independently from substantial form. As Suarez writes, “matter contains something in its potency that implies causality or a power of causing on the part of matter in its own genus.”²² This is to say that the

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²¹ Ibid, 51
²² Ibid, 55
form is somehow contained in the potency of matter, which engenders the form as its cause, but once the form has come to be, it stands outside of this cause as a separate substance. The substantial forms are, “made from the potential being of matter, in which they were contained, and they were educed into act by the power of the agent with the concurrence of the same matter.” This circumvents the problem of how a form could exist with another simultaneously, since the educed form existed only in an ‘inchoate’ state.

This solution is not without its own problems and many of the major thinkers in history have weighed in with their own interpretations and critiques, including Augustine, Averroes and Aquinas. In fact, through the end of the 18th century Kant even considered this question extensively, most notably in his lectures on metaphysics that he delivered from the early 1770’s to the early 1790’s. Following Baumgarten’s *Metaphysica*, Kant’s lectures on rational psychology always involve the question of the origin of the soul. In his *Metaphysik Mrongovius* lectures from the early 1780’s, Kant decides that God, not the parents, created all souls at the beginning of the world, a position he acknowledges as Preexistence. A position that he seems to maintain even as he considered the merits of epigenesis and became familiar with Blumenbach’s work on the formative power of the organism.

Nevertheless, in the case of substantial forms educed from matter, their union with matter is conceived on an entirely different model. When Suarez states that form is educed from matter in non-human beings, it is really just to say that the union of form and matter simply is the

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23 Ibid, 55
26 Ibid, 402-3
eduction of the form: “Another way to think of matter causing is to say that the union of form and matter is educed from matter.”

Suarez continues to make this more explicit, writing,

but an argument can be given, because eduction consists in the fact that there is an action or change intrinsically and essentially dependent on matter. But through this action the form comes to be and is at the same time united with matter. Therefore, through the same action the composite first essentially comes to be, and such a form is produced along with it and becomes actual outside the potency of matter.

In contrast to the human being, these beings only engage in two acts of generation: the generation of the matter and the generation of the form in the matter, and the generation of the form simply is the generation of the union. This is due to the fact that in the case of eduction the relation between form and matter is so close that we must say that the generation of the two are mutually caused and always already inter-dependent. Suarez clarifies this point even further when he writes,

But it is no contradiction that the same union is both from the form and as informing matter and is, as such, the joining of the form with the matter in order that by means of it the form is sustained by the matter. And thus the very same union, insofar as it is from the form, is the medium or principle by means of which the form actualizes the matter and constitutes the composite, and in this way it is said to be the causality of the form. But, insofar as through it the form adheres to matter and is sustained by it, it is a dependence of the same form upon matter. For the connection between such a form and the union is so intrinsic that they mutually depend upon each other for diverse reasons.

The substantial form educed from matter relies upon that matter as its very cause, but at the same time, insofar as it is a form that inheres in matter it still actualizes that matter by being united with it, thus the two are both cause and effect in these different respects.

To summarize, the problem of generation leads Suarez to posit two different types of substantial forms each with their distinct origins. Because the non-human form is educed from

28 Ibid, 56
29 Ibid, 86
matter, its generation and its union are one and the same thing. In contrast, the rational soul is not
duced but rather *produced*, and as such it requires a third completely separate act, which is the
generation of the union. Let us look into this final act that constitutes the complete human being
in more detail, as this will be the model that Descartes adopts throughout his work.

Once again, Suarez defines substantial forms as “a simple and incomplete substance,
which, as the act of matter, constitutes with it the essence of a composite substance.”\(^{30}\) In similar
fashion, Suarez writes, “the term ‘substantial form “signifies nothing other than a certain partial
substance which can be united to matter in such a way that it composes with it a substance that is
whole and essentially one, such as a human being.”\(^{31}\) These terms ‘incomplete’ and ‘partial’
constitute the heart of the matter when we inquire into the union of soul and body in the human
being. Just because the soul is simple, it is not perfected; form is but one of the incomplete
substances that makes the composite human being. In this sense, form is like matter, as matter
lacks determination without form, and hence is incomplete. Yet, although these substances are
incomplete outside of their composition, they are nevertheless both equally ‘disposed’ or
‘proportioned’ to each other such that they are prepared to receive the other incomplete
substance, and thereby form a union. The presence of the disposition on the part of both body
and soul is required in order to make their union possible. This is most clear when Suarez
discusses the matter of the body, such as when he writes that one of the conditions necessary for
the soul to inhabit the body is “a suitable disposition on the part of matter which form necessarily
requires in order that it can bestow its formal effect.”\(^{32}\) Because matter is defined as a kind of
potency, Suarez has no problem defining this disposition on the part of matter as a kind of
“receptive potency” or as a kind of open invitation to the soul. However, the soul is also

\(^{30}\) Ibid, 77

\(^{31}\) Ibid, 20

\(^{32}\) Ibid, 82
incomplete and disposed to be united with the body. Thus it too is conceived in this sense as a certain kind of potency:

Hence, just as we said above that we do not distinguish in matter between the principal and proximate principal of causing because the receptive potency, through which it causes, is not a property of it, but is the matter itself essentially, so in the form we can consider a certain quasi potency or aptitude for formally causing which remains, for example, in the separated soul, even if it does not actually inform.\(^3^3\)

This potency of the soul constitutes its ‘incompleteness’.

The union of soul and body is essentially based upon the potential to be joined together that both soul and body bear. This potential, variously called aptitude, disposition, or proportion, is not a matter of location or distance. The problem of the union of soul and body is not solved for Suarez when we ‘locate’ the soul in the body, and thus even though theories of the pineal gland had been available since Galen, who deemed it “the first instrument of the soul,” Suarez denies that the union is based on physical location: “It does not matter that there is a vast difference in the perfection of being between matter and rational soul, since for the union one need not pay attention to distance or nearness in the perfection of being, but rather to proportion and suitability in the mutual relation of act and potency, and this proportion between matter and soul is said to be sufficient. In fact, it is perhaps greater and more perfect than between matter and any other form.”\(^3^4\) The union is never a matter of proximity; it is based upon the necessary and sufficient conditions of the proportioning of two incomplete substances, one created \textit{ex nihilo} by God, the other sexually reproduced:

You will say: How can form which is so distant in its nature from matter be immediately united to matter through itself? This seems especially difficult in the case of the rational soul which is spiritual. I respond, in the first place, that there is not so great a distance that form and matter do not agree is genus. I respond secondly, that distance is not a hindrance if there is a due proportion. For, as Plato said in the Timaeus, mutual

\(^{3^3}\) Ibid, 80
\(^{3^4}\) Ibid, 140
proportion is, as it were, a bond between things which are united very closely and intrinsically. But this proportion consists in the nature of act and potency and the natural essential aptitude and mutual relation which they have between themselves.35

Spatial location is thus of secondary importance to proportion, and only once the proper proportion or disposition is in place can the soul unite with the body. Once they are united, then the question of the ‘seat’ of the soul becomes a question. First the union itself must be generated, and once again, this act of generation is the third thing generated in the case of the human being, the first two being the separate generation of the spiritual soul and the mundane body. In the passage from the Timaeus that Suarez cites in the previous quote, Plato addresses just how to bond two distinct entities. He writes, “But it isn’t possible to combine two things well all by themselves, without a third; there has to be some bond between the two that unites them. Now the best bond is one that really and truly makes the unity of itself together with the thing bonded by it, and this in the nature of things is best accomplished by proportion.”36 What these proportions are, how they are generated, and what kind of bond they create is the topic of much debate in the scholastic period. These questions are addressed in the second and third chapter of my dissertation.

The issue of the proportion of soul and body is only an issue at the point of generation when the body is first informed by the soul, thereby making it a human being. None of this is an issue for any substantial form other than the rational soul. In the case of non-human substantial forms, “generation itself seems to be the same thing as the union, since it was said that these forms come to be and are united by one and the same action.”37 And thus, we have seen that the generation of the form simply is the union, and thus the bonding of form and matter does not

35 Ibid, 81
36 Plato, 31c
require a proper disposition. However, in the case of the human being, “the rational soul comes to be in itself, at least by priority of nature, and receives its own being as independent of matter, and afterwards it is united to matter by another action by which the whole composite is generated.”38 Only once they are already unified can you say that there is an intimate closeness, and then we can wonder about the local presence of the soul in the brain. But Suarez, interested only in the doctrine of substantial forms, is concerned with generation, since that is the type of change that substantial forms are called upon to explain first and foremost.

In the case of the rational soul and human body, absolutely no part of the soul, be it vegetative or sensitive, can be educed through the body if the soul and body are to be united. It seems that if there were a sensitive soul present in the body before the rational soul united with it, it would interfere with the dispositions in the body that are essential to reception of the soul. That is, these proportions or dispositions are a kind of passivity that stand as the inverse to the act of matter. If there were another soul already present, then this would stand as an act, thereby interfering with the potentiality of matter to receive the soul. The soul and body must be related as act and potency, and insofar as any soul is an act, it is not suited to be informed by another soul: “since the sensitive soul is a substantial and specific act, as was proven, it is more distant from the rational soul with respect to the proportion required for that union than matter is from the soul, and in this way it impedes rather than aids the union.”39 One substantial form absolutely cannot inform another, and thus for the soul and body to be united, there must not be a previously educed soul already united to matter. The generation of the body, the generation of the soul, and the generation of their union must be distinct acts or else there will be no complete human at all.

38 Ibid, 56
39 Ibid, 140
Suarez’s writings on the relation of soul to body are interesting for a number of reasons, but none more so than his insistence on the problem of generation. We cannot be sure how to approach the union if we do not first understand how form and matter come to be in the first place. Is the form educed from matter or is it created *ex nihilo*? If the former is the case, then the problem of the union is solved. The union is only a problem for the rational soul, authored by God. Here, the union becomes a question insofar as we must consider the special nature of the ‘third thing’ that mediates two substances. Descartes will deny the existence of educed forms, yet he struggles throughout his writings to situate this question of the rational soul’s union with the body in his mechanical philosophy. These struggles ultimately result in an overhaul of how he considered the generation of the body, the soul, and their union. However, let us first see how Descartes eliminates all substantial forms outside of the rational soul, thereby clearing a path for his mechanical physics.

**Descartes’ Critique of Substantial Forms**

Descartes’ own understanding of a substantial form can be found in a letter to Regius from December 1641, where he writes, “I have understood by the name ‘substantial form’ a certain substance joined to matter and with it composing something whole that is merely corporeal, and which no less than matter, indeed more than matter, it is a true substance or a thing subsisting in and of itself.”

Following Suarez’s proof of substantial forms through the analogy with the rational soul, Descartes understands the form to be a kind of rational soul or mental substance that is joined to matter, thus making the relation of form and matter in

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40 AT III 502
Scholastic physics to be likened to “little souls joined to their bodies.”\textsuperscript{41} To explain what he means by this Descartes takes up the example of falling bodies to illustrate just what he objects to in Scholastic physics. According to the Scholastics, a heavy thing tends toward its natural place, the Earth, by virtue of some means which guides it there – the substantial form. Thus it is the nature or form of a heavy body that causes it to fall and this heaviness is intrinsic to the heavy thing and not an external cause. Again, we can follow Garber in citing the Coimbrian fathers: “Since heavy and light things tend toward their natural places, though absent from that which produces them, they must necessarily have been given some means that remains with them by virtue of which they are moved. But this can only be their substantial form and what follows from it, heaviness and lightness.”\textsuperscript{42} What makes this idea of a body falling on account of its form ‘mentalistic’ according to Descartes?

As he explains in his \textit{Sixth Reply}, because we conceive heaviness to be throughout the body and intrinsic to it, we have not articulated the concept of heaviness in the same way we do a material object; for we do not grant that ‘heaviness’ is any specific part of the object. Rather, it is mysteriously diffused throughout the body, thereby permitting this body to move in a certain direction. But how does the form move a heavy body downward rather than in any other direction? Descartes states that this can only be explained if we attribute to the body some kind of knowledge as to where ‘downward’ is on the basis of the substantial form. Therefore, the doctrine of substantial forms projects minds onto all the objects of nature. Descartes explains himself on this point by writing, “the fact that I thought that heaviness bore bodies toward the center of the earth as if it contained in itself some knowledge of it. For this cannot happen

\textsuperscript{41} AT III 648
without knowledge, and there cannot be any knowledge except in a mind.\textsuperscript{43} Thus the primary offense committed by the doctrine of substantial forms begins with the fact that the theory hopes to explain the behavior of definite objects in Nature by attributing a kind of intention or agency to each and every thing, thus making them, “things capable of forming intentions and exercising volition, little souls joined to matter.”\textsuperscript{44}

This criticism of substantial forms incorporates both a fundamental refutation of our knowledge gained from the senses as well as basic prejudices acquired as infants. Consider the role of sensation. In the opening lines of \textit{Le Monde}, Descartes presents an essential distinction between our sensations on the one hand and that which causes our sensations on the other. As Gilson has pointed out, these passages contain the seed of Descartes’ elimination of substantial forms from his own physics.\textsuperscript{45} Descartes begins the \textit{Traité de la Lumière} as follows: “In proposing to treat light, the first thing that I want to warn you of is that there is possibly a difference between the sensation that we have of light, which is to say the idea of light that is formed in our imagination by the intermediary of our eyes, and what is in the objects that produce this sensation in us, which is to say what is in the flame or the Sun that is called by the name of Light.”\textsuperscript{46} What is essential here in reference to the doctrine of substantial forms is that Descartes begins his treatment of nature by distinguishing between the idea of light in the mind and the light that is in nature itself. In order to achieve any certain knowledge of nature, it is imperative that we keep these realms distinct. Later, in his \textit{Objections and Replies}, Descartes distinguishes between sensations and the objects that cause our sensations, only here he defines

\begin{footnotesize}
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\item AT VII 441-2
\item AT XI, 6
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three realms of sensation. The first aspect of sensation is “the immediate stimulation of the bodily organs by external objects,” a realm that is strictly corporeal since it involves merely the physical interaction of bodies. The second level of sensation involves “the immediate effects produced in the mind as the result of its being united with a bodily organ that is affected thus and so.” In Descartes’ philosophy, this is properly speaking a sensation, since it implicates not just a causal relation between an organ and an object, but also it creates an idea in the mind of things like pleasure, pain, hunger, or thirst. Thus he will say that these perceptions arise from the union of mind and body. Third, there is the realm of judgments, of which Descartes writes, “Then there are the judgments we have been accustomed to make from our earliest years – judgments that are triggered by these bodily organs.” As we have seen from his writings in the *Meditations* and the *Principles* it is at this point that all our erroneous beliefs about the world seep in. As Descartes explains, “When I see a stick, what happens? A wrong answer: certain ‘intentional images’ fly off the stick towards the eye. The right answer: rays of light are reflected off the stick and set up certain movements in the optic nerve, and via the optic nerve, to the brain, as I have explained at some length in my *Optics*.“47 The error in the first answer lies in the fact that one believes that the sensations of the color, size, and shape of the stick are actually ‘in’ the stick, when in fact all that is given by the stick are certain stimulations of the organism. These are the judgments contributed by our earliest years: the judgments that lead us to believe that sensations represent the way the world really is. That is, we come to believe that the pain we feel by putting our hand on a hot stove is actually in the hand or the hot stove, when pain is actually a factor of the mind.48

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47 AT VII, 437-9
48 See Pr I 66, 67, 68
Descartes believes this error is most blatant in childhood because it is in our infancy that the mind is most intimately entangled with the body. In childhood, we come to rely on a type of common sense thinking that projects the sensations and judgments of the mind out into the world. Descartes summarizes the circumstances of the child which permits it to make this error when he writes,

[W]hen the machine of the body, which was so constituted by nature that it could of its own inherent power move in various ways, turned itself randomly this way and that and happened to pursue something pleasant or to flee from something disagreeable, the mind adhering to it began to notice that that which it sought or avoided exists outside of itself and attributed to it not only magnitudes, figures, motions, and the like, which it perceived as things or modes of things, but also tastes, smells and the like, the sensations the mind noticed were produced in it by that thing.\textsuperscript{49}

Furthermore, that this error is carried forth into our adult years is aided by our own forgetfulness of the circumstances of our youth. Thus, by accepting these prejudices we forget that we have accepted judgments without critically examining them, and this permits us to retain a number of prejudices in favor of the senses through adulthood. As we have seen through the example of falling bodies, the most egregious error we commit on the basis of this common sense thinking is that we confuse the products of the mind with the products of the body, thereby attributing strictly intellectual properties to bodies and strictly corporeal properties to the mind.

This is nothing other than the essence of Scholastic physics, which attributes mental properties to bodies through their doctrine of substantial forms. Garber points to a letter where Descartes himself draws the link between the prejudices of our infancy, our confusions surrounding sensation, and the doctrine of substantial forms:

The first judgments we made in our youth, and later also the common philosophy [i.e. the scholastic philosophy] have accustomed us to attribute to bodies many things which pertain only to the soul and to attribute to the soul many things which pertain only to the body. They ordinarily blend the two ideas of the body and the soul, and in the combining

\textsuperscript{49} AT IX 71
of these ideas they form real qualities and substantial forms, which I thought ought entirely to be rejected.\(^{50}\)

As Garber explains, the first judgments of our youth attributed mental qualities such as the sensations of color, tastes, tendencies, and the like to bodies, and thus because the scholastic position insists that these mental qualities are inherent in the bodies, it merely perpetuates the errors we made in our youth. Descartes makes this quite clear in his *Sixth Reply*, when he writes,

> From infancy I had formed a variety of opinions about physical things – all relating to the features of things that were relevant to my own survival – and later on I kept these early opinions. But at the age at which I had formed them, my mind was more firmly attached to my sense organs than it became later, and it employed the bodily organs less correctly than it now does. That double fact had a double upshot: my mind had no thoughts apart from my sense-organs, and it perceived things only in a confused manner. Although it was aware of its own nature, and contained an idea of thought as well as of extension, my mind never thought about anything without depicting it in the imagination. *It therefore took thought and extension to be one and the same thing, and understood in corporeal terms all its notions of things related to the intellect.* I had never freed myself from these early opinions, so I didn’t distinctly know anything, and supposed everything to be corporeal.\(^{51}\)

It is on this count that we can understand why the *Meditations* must begin with a critique of “the false beliefs that I had from my earliest youth” but then go on to critique the veracity of the senses: The false beliefs of youth are nothing other than an erroneous faith in the senses. Although this was somewhat legitimate given the circumstances of our infancy, it is not properly philosophical thinking in its Scholastic iteration. Therefore, the Scholastic position is rejected as merely a complex elaboration of a child’s mind.

**Descartes on Matter and Motion**

\(^{50}\) AT III 420  
\(^{51}\) AT VII 441
Descartes attempts to replace the Scholastic doctrine of substantial forms with his new ‘mechanical’ explanation of nature. He is not alone in this enterprise as a number of critiques of Scholastic physics had come before him from the likes of such thinkers as Giordano Bruno, Sebastian Basso, and Descartes’ friend Isaac Beekman.⁵² And of course, Descartes confidante Marin Mersenne had gone a long way toward establishing a new outlook on nature.⁵³ But Descartes goes furthest in integrating this new science with the question of the union of soul and body, and so establishes a new concept of movement, force, and a unique role for God.

Descartes’ most thorough works on nature are his early *Le Monde* and his later *Principles de la Philosophie*. In these texts, we can find everything from descriptions and explanations of weight to the outline of human nervous system. In the first section of the *Principles of Philosophy* he explains his enterprise as follows: “I have described this earth and indeed the whole visible universe as if it were a machine: I have considered only the various shapes and movements of its parts.”⁵⁴ As is well known, Descartes believes he describes the movements and changes of nature strictly in terms of extension and the uniform (unaccelerated) motion of particles which thereby delineate extended substance. He believes that this sort of explanation is precisely what is invoked to explain the movements of any man-made artifact as in his famous watch example, and that nature does not require any extraneous metaphysical concepts outside of what we need to explain any machine. He claims, “I do not recognize any difference between artifacts and natural bodies except that the operations of artifacts are for the most part performed by mechanisms which are large enough to be easily perceivable by the senses – as indeed must be the case if they are to be capable of being manufactured by human beings. The effects

⁵⁴ PR I, 188
produced by nature, by contrast, almost always depend on structures which are so minute that they completely elude our senses.” Descartes’ method aims to explain both mechanical, man-made artifacts and natural objects in the same way.

He provides dozens of examples of this in the two texts I have mentioned, but in a letter to his disciple Regius in 1642 Descartes claims that the best example to look at in order to get a clear picture of his method is his explanation of the formation of salt in his Meteorology. Though this text is not widely studied, it is important to remember that his famous Discourse on Method for Rightly Directly One’s Reason and Searching for the Truth in the Sciences is in fact just an introduction to the triptych composed of his Geometry, Optics, and Meteorology. Conversely, these latter texts are meant to give a clear illustration of the methods he lays out in the Discourse, particularly the dense and complex Second and Sixth divisions.

In the opening pages of the Meteorology, Descartes invokes his method and delivers a statement on the place of substantial forms in the work: “Then, know also that in order to keep my peace with the philosophers, I have no desire to deny that which they imagine to be in bodies in addition to what I have given, such as their substantial forms, their real qualities and the like; but it seems to me that my explanations ought to be improved all the more because I shall make them depend on fewer things.” Wherever we might stand with the secondary literature on whether or not this statement and others like it are genuine, we can certainly say that nowhere in the following pages does Descartes ever invoke a substantial form to explain the behavior or emergence of a being. Instead, as he states in the Principles, we find only detailed accounts of

55 PR IV, 203
56 AT III, 506
matter and motion, and this is just what his explanation of the formation of salt is based upon. Let us look briefly at his explanation to see just what is meant by ‘matter and motion’.

When we explain the formation of salt, we must first understand the evaporation of water. In the Scholastic framework, the evaporation of water would be explained in terms of an essential tendency of water to rise, the attractive force of the sun, and the residual salt would be explained in terms of its propensity to reside close to earth. In Descartes’ work, vapors are created when pools of water are left in the sun, and the light waves of the sun cause the particles of water to quiver with agitation. When these particles are agitated violently enough, they rise into the air much the way little specks of dust are kicked up by feet over a dirt road. When there is a crowd, much dust is agitated and rises upward, and likewise when there is enough sunlight, much water evaporates. Descartes is adamant that these particles of water rise, “not because of some particular force which attracts them, but solely because they cannot find any other place in which it is as easy for them to continue their movement, just as the dust of a plain rises when it is merely pushed and agitated by the feet of some passerby.”

Descartes, unlike the Scholastics, denies the sun has any force of its own, but rather, as he had demonstrated in the Optics, it simply has the capacity to agitate the particles that compose earth, water and air. As the sun agitates the particles of water, which are “long, smooth, and slippery, like little eels”, they spin upward and separate. “The reason for this is that when these particles compose the bodies of water, they move strongly enough to bend and interlace, by sliding against one another, as you see them represented here at A; whereas when they have the form of a vapor, their agitation is so great that they spin about very rapidly in all directions, and for the same reason they are stretched throughout their entire length, in such a way that each has the force to drive away from itself all

58 Ibid, 269
59 Ibid, 265
60 Ibid, 264
its fellows which try to enter the small sphere that it describes, as you can see them represented at B.\textsuperscript{61}

A second diagram demonstrates how this spinning causes the particles of water, once loosely interlaced, to detach, and thus their spinning, detaching and rising are all the same motion. According to Descartes, this process occurs just like the rising action of a ball on a string when it is spun. This spinning action gives each particle the force to rise. Yet, what is this force? And in the case of Figure 2, whose hands are these that spin the axis? In the Scholastic doctrine it was the active force of the substantial form that caused matter to rise. In Descartes’ philosophy,

\textsuperscript{61} Ibid, 271
which refuses recourse to substantial forms, the cause of these motions is not so easy to decipher. These questions need to be reckoned with, but we will hold off until the principles of Cartesian physics are clearer.

Now that Descartes has explained how water rises and leaves the earth, the formation of salt is fairly easy to explain. The salt particles are simply the parts in water that are too large to be agitated by the sun. These particles, which are rather thick, heavy, straight, and long, do not spin around, and thus “they can hardly be suspended in the air for any length of time, be they in the action of rising or descending, without one of their ends pointing downward, and thus being in a position perpendicular to the earth.”62 Accordingly, ocean water left out in the sun for any extended period of time sees the water evaporate into the air, leaving behind a cluster of salt. This is Descartes explanation of the formation of salt, which he claims best illustrates his mechanical method.

How exactly is this explanation to be seen as a mechanical operation? In fact, the modern day reader would be hard pressed to find anything mechanical about it, and as Daniel Garber argues, neither would any of Descartes’ contemporaries. Nowhere in any of Descartes books dealing the mechanical treatment of nature do we ever find anything ‘mechanical’ at all: no pulleys, no levers, no inclined planes, nothing that looks anything like a machine. Moreover, others who study nature in Descartes’ time do not utter ‘mechanics’ and ‘nature’ in the same voice, and in fact, most writers oppose mechanics to nature. What might Descartes mean when he writes, “I have described this earth and indeed the whole visible universe as if it were a machine.”63

As Garber explains, when a machine is designed, it is designed for a purpose. For instance, a gun is designed to shoot bullets, an elevator is designed to lift, and an ax is designed to cut, and

62 Ibid, 278
63 AT IX 310
such is the case with all tools. Those who studied nature in Descartes’ time believed mechanics opposed nature. For instance, the physiologist William Harvey writes, “Mechanics: whatever controls that through which nature is overcome, and helps with difficulties that arise when something unnatural is useful.” And this is not only how those who studied nature understood mechanics, those who studied machines saw the same relation. In many of the mechanics textbooks of the 16th century, these tools are designed to overcome obstacles that nature presents to us. This is illustrated in a popular textbook from the time, *Mechanica*:

> Nature often operates contrary to human interest; for she always follows the same course without deviation, whereas human interest is always changing. When, therefore, we have to do something contrary to nature, the difficulty of it causes us perplexity and art has to be called to our aid. The kind of art which helps us in such perplexities we call Mechanical Skill.

Thus, one thing Descartes might mean when he says that he treats all of nature as if it were a machine would be that he will collapse the dichotomy and treat nature as if it were designed for purposes, just as machines are. In so doing, he would attribute final causes to all of nature’s actions. Of course, Descartes does not choose this option, which is not to say that God does not create things for a purpose, but only that human knowledge is not capable of comprehending His reasons. In the Fourth Meditation he writes,

> For, in the first place, knowing that my nature is extremely feeble and limited, and that the nature of God is on the contrary immense, incomprehensible, and infinite, I have no further difficulty in recognizing that there is an infinitude of matters in His power, the causes of which transcend my knowledge; and this reason suffices to convince me that the species of cause termed final, finds no useful employment in physical [or natural] things; for it does not appear to me that I can without temerity seek to investigate the [inscrutable] ends of God.

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66 AT VII, 55
Instead, he chooses to ‘bracket’ the machine’s purpose as Garber puts it, and in so doing he looks only at the functioning of the machine without regard to its purpose. In so doing, we can still call it a ‘machine’ in so far as we strictly study the functions and movements of parts and particles, but we do not see the object as designed for a purpose or whether it accomplishes anything well or not. Following Garber, it is worth quoting Descartes at length in the Sixth Meditation where he explains his comparison of a watch to the human body. Descartes writes,

A clock constructed with wheels and weights observes all the laws of its nature just as closely when it is badly made and tells the wrong time as when it completely fulfills the wishes of the clockmaker. In the same way, I might consider the body of a man as a kind of machine equipped with and made up of bones, nerves, muscles, veins, blood and skin in such a way that, even if there were no mind in it, it would still perform all the same movements as it now does in those cases where movement is not under the control of the will or, consequently, of the mind. I can easily see that if such a body suffers from dropsy, for example and is affected by the dryness of the throat which normally produces in the mind the sensation of thirst, the resulting condition of the nerves and other parts will dispose the body to take a drink, with the result that the disease will be aggravated. Yet this is just as natural as the body’s being stimulated by a similar dryness of the throat to take a drink when there is no illness and the drink is beneficial. Admittedly, when I consider the purpose of the clock, I may say that it is departing from its nature, and similarly when I consider the mechanism of the human body, I may think that, in relation to the movements which normally occur in it, it too is deviating from its nature if the throat is dry at a time when drinking is not beneficial to its continued health … As I have just used it, ‘nature’ is simply a label which depends on my thought; it is quite extraneous to the things to which it is applied, and depends simply on my comparison between the idea of a sick man and a badly made clock, and the idea of a healthy man and a well-made clock…

In other words, when we speak of ‘nature’ the telos is not really there, it is just something imposed by us. Even though a watch is in fact designed by its maker with a purpose, whether or not it performs that task is irrelevant to the functioning of its parts: the springs and gears still function the exact same way even when it is an hour slow. Of course, there may be final causes in nature, but it is only God who can know that, and thus they have no place in science. When we

67 AT VII 84-5
set aside purposes, we see that all that is left is matter and motion devoid of ‘intentions’. In the example of salt, we do not need to know what the purpose of sun-warmed water is and whether or not it is designed to rise upward by an attractive force of the sun. We only need to look at the motion of the particles, and that is enough to explain the behavior of the object in question.

However, Descartes does not merely say that his thinking on nature is mechanical. In a letter to Mersenne from July 27, 1638, he claims, “all of my Physics is nothing other than geometry.” Just as we saw that when Descartes speaks of machines, he does not mean to speak in terms of purposes, we find that when he speaks about physics in terms of geometry, it is not to say that the study of nature is abstract mathematics. In fact, the study of nature is always absolutely concrete, while at the same time maintaining its mechanical and geometrical foundations. Let us now investigate this ‘geometrical’ method of inquiry.

Again, the study of nature will always be strictly limited to matter and the motions unique to each object and action. But the application of the laws of motion must never contradict experience, and thus the method not only appeals to matter and motion, but we must deduce hypotheses from matter and motion that can be reconciled with our experiences. On this point, Descartes writes to Mersenne on May 27, 1638, “Know that there are only two ways to refute what I have written, one being to prove by certain experiences or reasons that the things I supposed are false; and the other is to show that what I have deduced from these experiences should not be deduced from them.” For instance, in the case of the formation of salt, Descartes begins with certain observed properties of salt, namely its size, shape, and weight, and from these observations he deduces the formation of salt flats. It is not at all the case that Descartes uses his hypotheses to prove the facts, and in turn employs the facts to support his hypothesis.

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This would be circular. On the contrary, Descartes employs certain principles regarding space and motion to make the formation of salt intelligible, and the existence of the salt supports the validity of the principles. These principles are what we might call ‘bedrock’ suppositions: axioms that are too obvious to require a proof. These suppositions are the axioms of geometry, as Descartes explains to Plemius:

    And the principles or premises from which I deduce these conclusions are only the axioms that the demonstrations of the Geometers depend on such as, ‘the whole is greater than the part’, if you take away equals from equals the remaining ones will be equal,’ etc. not however, abstracted from all sensible matter, as with the Geometers, but applied to various experiences known by sense and undoubted, as from the fact that the particles of salt are oblong and inflexible, I deduced the square shape of its morsels, and many others which are evident to the senses.70

In the analysis of salt, Descartes makes one supposition: bodies are composed of insensible particles. This claim is not totally baseless, as we know that all objects are composed of parts. In comparison to the Scholastic thinkers who posit substantial forms, real qualities, and the four elements, we can understand what Descartes means when he claims his analysis depends on fewer things. His entire physics is based upon the motion of particles and the phenomena are deduced, on the basis of the axioms of geometry, from these motions. We will see this same method in play when Descartes explains the heat of the heart, a demonstration at the center of the union of soul and body.

However, is this all that Cartesian physics is based upon? When we look at physics, we see that it is not simply geometry, or simply reducible to mathematics, but rather it deals with beings that are actual and existent. As Descartes himself said in the above cited letter to Plemius, his method is “not however, abstracted from all sensible matter, as with the Geometers, but applied to various experiences.” In truth, matter and motion are not the

fundamental principles of Descartes’ physics. Although it is true that matter occupies all space in the universe, and “all the variations of matter or all the diversity of its forms, depends on motion,”\textsuperscript{71} this motion is not sufficient in itself. The objects delineated by their particular motions and parts must endure as substances; any substance that ceases to endure, ceases to be.\textsuperscript{72} Any finite substance is not the cause of its own duration, and as Descartes says most famously in the \textit{Meditations}, a higher power must constantly sustain my existence: “All of my life can be divided into innumerable parts, each of which is entirely independent of the others, so that from the fact that I existed a short time ago it does not follow that I ought to exist now, unless some cause as it were creates me again in this moment, that is, conserves me.”\textsuperscript{73} This is the case not only with thinking substances, but with all bodies: “when I examine the idea of body, I perceive that it has no power in itself through which it can produce or conserve itself.”\textsuperscript{74} All finite things need a cause that conserves them as such, and in Descartes’ system, this is God who constantly sustains the world he originally created.

Accordingly, insofar as it is motion that generates the diversity of nature, there must be something that generates this motion, thereby sustaining things as distinct things as well as generating their behaviors. This cause is ultimately God, but God accomplishes this through ‘force’, a rather obscure concept in Descartes’ work. It is force that animates the matter around us, causing them to move, and this creative force is in turn derived from God’s will. As Martial Gueroult writes, “Hence it is clear that while the modes and essences of things are referred solely to extension and motion, the existences with which physics deals, the forces which animate these and the laws which govern them, should be referred to God, who is the principle of the forces by

\textsuperscript{71} AT IX 75
\textsuperscript{72} Ibid 53
\textsuperscript{73} AT VII, 48-9
\textsuperscript{74} AT VII 118
which these things exist, endure and change.”75 It is not the case that all of Descartes’ physics is ultimately reducible to matter and motion, since it is in fact force that animates matter and puts it in motion, and this force is attributed to God. Thus, God ultimately underlies nature, albeit through mediating forces. Descartes confirms this in the Principles, when he writes, “As far as the general [and first cause] [of motion] is concerned, it seems obvious to me that this is none other than God Himself, who, {being all-powerful} in the beginning created matter with both movement and rest; and now maintains in the sum total of matter, by His normal participation, the same quantity of motion and rest as He placed in it at that time.”76 God is, as Descartes puts it in the Fifth Reply, the cause of being, or causa secundum esse, which makes Him responsible for both creating and sustaining beings.

Force should be conceived as the power inherent to a thing that makes the object exist as such along with its particular modes. It is not a dependency of extended substance, but rather it is what extended substances depend upon to achieve their certain modes of existence. Consequently, Descartes presents a sort of three tiered ontology whereby God expresses his will through force, and force inheres in the thing causing it to endure with its particular modes. As such, force is both a kind of effect of God’s will as well as the cause of the modes of extension. Even though this force is governed by God’s will and the laws he puts in place – the principles of conservation, the law of inertia, and the rectilinearity of motion – this force is not God Himself. Force is finite and therefore measurable through the formula \(mv^2\). Force is immanent to this world, and as such we should not confuse an infinite transcendent God with nature.


76 PR II 36, see also AT V 403-4
Force, playing the role of both cause and effect must be seen as a kind of mediator between God’s infinite will and the finite world of objects. As such, Descartes presents two views on nature: one that describes nature strictly in terms of matter and motion, and one that investigates nature in terms of its causes. We saw this implicitly in the quote from the *Meteorology* where Descartes wrote,

The reason for this is that when these particles compose the bodies of water, they move strongly enough to bend and interlace, by sliding against one another, as you see them represented here at A; whereas when they have the form of a vapor, their agitation is so great that they spin about very rapidly in all directions, and for the same reason they are stretched throughout their entire length, in such a way that each has the force to drive away from itself all its fellows which try to enter the small sphere that it describes, as you can see them represented at B.  

That is, we can describe the movement of particles, but when we want to provide reasons for their movement, we find ourselves in the realm of force, and ultimately appealing to God. In the example from Figure 2 of the *Meteorology*, we can examine the motion of the cord, and we examine the force that moves it, but ultimately there is a pair of hands that spins the pivot: these are God’s hands. As Martial Gueroult has pointed out, Section II of the *Principles* breaks down in such a way that these two perspectives on nature become quite clear. Investigating that text, we find that articles 4-35 speak in terms of extended substance and the geometrical definition of motion, but from article 36 to the end of the section, Descartes is no longer examining motion but rather investigating its causes. As Gueroult explains,

The first [part] rests on an immanent principle, extension and its modes (motion and rest). Situating itself from the point of view of essence it decides questions of nature: the nature of matter (pure extension, which is absolutely full, with no atoms and no void etc.) and the nature of motion (motion as the ground of the diversity of modes, its relativity, its definition, its circularity in the plenum, its differentiating function). The second rests on a

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transcendent principle, God and His creative will. Situating itself from the point of view of existences, it decides questions of cause: causes of motion or forces, the laws of motion, causes or forces accounting for hardness or fluidity.  

Why is this second perspective necessary? Why can Descartes not just explain nature in terms of matter and motion without recourse to forces and God? God must have a hand in nature precisely because Descartes has eliminated substantial forms. As we saw in the writings of the Coimbrarian Fathers and Suarez, substantial forms serve as the cause of an object’s behavior: they provide the force of motion, rest, direction and so forth. However, there are no forms in the Cartesian world to serve as the motives for change, and Descartes fills that void with God Himself. Thus, God takes over as the substantial cause of bodies and their dispositions. Garber makes this exceedingly clear when he argues, “God enters Descartes’ physics to do the business substantial forms did in the Aristotelian system, as he understood it, to cause bodies to behave in their characteristic ways. And, I think, by the late 1640’s, if not before, Descartes held the view that when God causes motion he causes it in just the way we do, by way of an impulse that moves matter in a way that we can comprehend only through immediate experience.” Garber supports this hypothesis with a quote where Descartes explains how he understands God to effect matter through force: “Although I believe that no mode of acting belongs univocally to God and to His creatures, I confess, nevertheless, that I can find no idea in my mind which represents the way in which God or an angel can move matter, which is different from the idea that shows me the way in which I am conscious that I can move my own body through my thought.” The effects of God in this world, which fills in for the role performed by substantial forms in Scholastic

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80 AT V 347
physics, is conceived on the model of how our soul effects motion in our bodies: that is, it not
something known through reason, but only through direct, immediate experience, a fact that is so
fundamental it is only muddled in explanation.\(^81\) This amounts to saying that the motion of
bodies is analogous to the effects of the soul on our own body, a position held explicitly by
Suarez. The difference is that in Suarez it was ‘little souls’ attached to bodies through an
immanent substantial form, while in Descartes the analogy with the soul traverses the realm of
God who effects motion and behaviors in this world just as the soul forces the body to move.
From this perspective, the geometric and mechanical conception of nature is not so radical in its
critique of Scholasticism, as it fails to consider nature outside of the anthropomorphic view
modeled on the experience of motion in our own body.

In the end, Descartes is not entirely accurate about his own thinking when he states that
the doctrine of substantial forms “ought entirely to be rejected,” as he will make one important
concession to scholastic thinking and admit just one substantial form: the human soul. He makes
this assertion a number of times in his correspondence and elsewhere. In a note from January
1642, he writes that the human soul is “the only substantial form”\(^82\) and again, the human soul is
“the true substantial form of man.”\(^83\) In explaining what exactly he takes this to mean, Descartes
points to nothing other than the example of heaviness and falling bodies that he is otherwise so
intent on critiquing. Addressing the Scholastic account of heaviness in a letter to the Princess
Elisabeth of Bohemia from May 21 1643, Descartes writes,

> For example, in supposing that heaviness is a real quality, of which we have no other
knowledge but that it has the power to move a body in which it is toward the center of the
earth, we have no difficulty in conceiving how it moves the body, nor how it is joined to

\(^{81}\) AT V, 222; See also Garber, Daniel. 1992. *Descartes’ Metaphysical Physics*. Chicago: The University of Chicago
Press. p. 276

\(^{82}\) AT III, 503

\(^{83}\) AT III 505
it; and we do not think that this happens through a real contact of one surface against another, for we experience in ourselves that we have a specific notion for conceiving that; and I think that we use this notion badly, in applying it to heaviness, which, I hope to demonstrate in my Physics, is nothing really distinct from body. But I do think it was given to us for conceiving the way in which the soul moves the body.⁸⁴

More than five years later, in a letter to Arnauld, we find similar statements regarding the analogy of heaviness and the soul,⁸⁵ but Descartes’ most explicit comments regarding the nature of this analogy come in his discussion of heaviness in his ⁶th Reply which we have already mentioned.

As we have seen, one of Descartes’ favorite examples to illustrate the confusion of thought and extension is heaviness and the behavior of falling bodies. In the Sixth Meditation, Descartes explains that his former idea of heaviness was taken from the mind as he realizes that the Scholastic doctrine attributes a certain volition of intentionality to the falling body, a point that we have cited above. Although this is what makes it especially clear that the Scholastic notion of heaviness is based upon the notion of the mind, he provides another pertinent example in the same paragraph. Descartes writes,

Although I pictured heaviness as being scattered all through a heavy body, I still didn’t attribute to it the extension that constitutes the nature of a body. […] Also, although the heaviness was scattered throughout the entire body, I saw that it could exercise all its force in any one part of the body: if the body is hung from a rope attached to one part of it, it would still pull the rope down with all its force, as though all the heaviness were in part actually touching the rope instead of being scattered throughout all the parts. And that 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.⁸⁶

⁸⁵ AT V 222-3
⁸⁶ AT VII 442
This final statement is corroborated by what Descartes writes in the *Passions of the Soul*, where in Sections 30 and 31 he explains how the soul is united to all the parts of the body conjointly, but is focused in its parts as well, most notably the pineal gland. Gilson summarizes this analogy between the Scholastic account of heaviness and Descartes’ admission of the rational soul as the only substantial form most clearly in writing, “Suffice it to say that weight is a soul, since weight is thought as an immaterial substance, united to a body, present throughout at once in each of its parts and specially exercising its actions on the body through the intermediary of one of its parts.”87

However, there is still much more to say regarding the nature of the human soul as the only substantial form in Descartes’ thought. In order to more fully comprehend how this notion functions, we must turn to the explicit discussions of the human being in terms of substantial forms that Descartes followed. One of the most influential and relevant studies of the human being in this context appears in work of Jean Fernel, a 16th century physiologist with whom Descartes was familiar and who makes a sustained attempt to give a physiological account of the union of soul and body. In laying out just how Fernel understood the human being as a substantial form we will have some historical background to help us see in what ways Descartes was original and in what ways he was quite traditional in his understanding of the soul-body union.

**Works Cited**


Chapter 2
Dispositions and the Heat of the Heart

According to Scholastic philosophy, if form and matter are to be united to form a human being, then matter must be endowed with certain ‘dispositions’ or ‘accommodations’. As we have seen, this necessity is a direct result of the fact that the soul is generated from God while the body is created by the parents. Though Suarez says very little about the precise nature of these dispositions, the medical community of the time was heavily involved in investigating and elucidating their nature. Anyone who reads Descartes’ own Traité de l’homme would find a virtual catalogue of dispositions. However, Descartes was not without precedent in his investigation of the primary dispositions responsible for welcoming the soul into the body. In his publications and correspondence he favorably mentions two physiologists whose work he drew upon in this regard: Jean Fernel and William Harvey. We will turn now to the work of these two figures in order to gain a more precise account of what a disposition is. It will become clear that these thinkers put the heat of the heart above all other bodily functions in terms of its role in accommodating the divinely created soul. However, what is not clear is what the nature of this heat is, how it relates to the soul, and what role the heart plays in maintaining it. Is the essence of the vital heat a divine spirit? Or is the blood itself supernatural? Or is this heat a peculiar feu sans lumière?

The Doctrine of Substantial Forms in Jean Fernel

Jean Fernel (1497-1558) was one of the leading proponents of Galenism in the Renaissance period. He was the physician to his king, Louis De Bourges, just as Galen was the
physician to Marcus Aurelius, As John Forrestor writes, Fernel’s Physiologia from 1567 was the first systematic treatment of physiology in the West. Moreover, Fernel is thought to be the first to use the term ‘physiology’ in its modern sense, which is to say, the science of the healthy body, as it had previously referred to the study of nature in general. Although he is not as well known today as Vesalius or Paraclesus, he was one of the foremost philosophers of the human body in his time. This fortune was in part due to the historical circumstances in which printing had become significantly more efficient, thereby allowing textbooks to be produced in any field for reasonable prices. Moreover, as Forrestor and others have noted, there were more medical students than ever in France, which, in conjunction with a growing public audience interested in medicine, made the conditions ripe for a systematic textbook on the medical sciences. Forrestor writes, “Fernel’s textbooks really did provide a universa medicina for their time,” and in fact Universa medicina was precisely the name given to the collection of Fernel’s medical works which remained in print for over 100 years from 1567 to 1680. Regarding Descartes, both Canguilhem and Gilson, amongst others, recognize his influence noting that Descartes mentions Fernel by name as one of the most respected medical authorities of the time in a letter to Plempius from February 15, 1638. From that date, we know that Descartes was familiar with Fernel’s oeuvre before he wrote any of his major texts on the mind-body union or his writings on the idea of the human being as a substantial form. Furthermore, Gilson points out that while Descartes was in school he had studied the Coimbrian text Parva Naturala, a textbook which was merely a vulgarization of Fernel’s more scientific work, and, in Gilson’s words, “the great

89 Gilson, Étienne. Études sur le role de la pensée médiévale dans la formation du système cartésien. Paris: J. Vrin. 1951. p. 52
authority to which the commentators of Coimbra refer when they give an anatomical description is that of a doctor from the Renaissance, Jean Fernel.\textsuperscript{91}

On the question of substantial forms, two of Fernel’s texts are essential: the first is the \textit{Physiologia} (1567), and the other is his earlier \textit{De adbitis rerum causis}, which Forrestor believes was finished sometime before the \textit{Physiologia} was started in 1538. D.P. Walker confirms that although the text was not published until 1548, it was written much earlier.\textsuperscript{92} To comprehend the nuances of Fernel’s doctrine of substantial forms and the living organism, we must first begin with \textit{De adbitis rerum causis}, or \textit{On the Hidden Causes of Things}, for it is in Book 1 of this text that Fernel lays out his basic metaphysical position on the relations between form and matter. This text, a dialogue between three orators named Brutus, Eudoxus, and Philias, ultimately aims to demonstrate Hippocrates’ claim that “there is a divine aspect present in diseases.”\textsuperscript{93} This argument is primarily the topic of Book 2, whereas Book 1 begins with Fernel’s fundamental positions on nature and the human body.

Fernel accepts the basic framework of Aristotelean metaphysics when he defines Nature as the form/matter composite that defines each individual thing. However, because Fernel works at the crossroads of Aristoteleanism, Galenism, Platonism, and Christianity, his understanding of just what this composite consists in and how it is brought about is somewhat unique to his own work. Fernel begins with his definition of matter, which he believes is the first component supplied in the union of form and matter: “Matter is the unchanging and permanent substrate, out of which everything is created; and although it is not found on its own and apart from form, it is

\textsuperscript{91} Gilson, Étienne. \textit{Études sur le rôle de la pensée médiévale dans la formation du système cartésien.} Paris: J. Vrin. 1951. p. 52
the first thing underlying a body, the foundation, so to speak, on which the form rests and is supported, as if it were the container of all alterations and changes." But because matter is uniform throughout nature, we only come to differentiate distinct things in nature on the basis of form: “[T]here being diverse ranks of the things that exist from nature, and differing kinds, and each possessing its own nature, something else must be established in addition to that common matter, from which individual things may acquire their form, and be of their own nature.” From these passages, we see that in his basic approach to nature, Fernel does not stray far from the late Scholastic position on substantial form, whereby matter is joined with a form to give birth to a particular ‘this’; the imposition of form upon uniform matter gives rise to the diversity of nature.

However, in the course of the discussion the problem soon arises as to how it can possibly be the case that a human body, composed of diverse materials including flesh, bones, and blood, can possibly be a simple ‘this’ – a human being. Fernel must demonstrate “that the form of a composite body is simple and similar, and also dispersed through the parts,” a point that we have seen Descartes argue through the analogy of heaviness. If the form is simple, how can a simple and uniform soul reside equally in all the diverse parts of the body? This question is pushed most forcefully by Brutus, the antagonist of the discussion, when he asks how it can be the case that the form appropriate to a dog can join with bone, flesh, blood, and cartilage when these materials share no resemblance whatsoever, but a dog bone and a mule bone are quite similar and the mule body never takes on the form of a dog? If this question is not answered, then the idea of a substantial form seems incomprehensible, since there is no explanation as to how the different components of an organism, which without a substantial form exists partes

94 Ibid, 139
95 Ibid, 151
96 Ibid, 199
97 Ibid, 205
extra partes, can be united to compose a whole organism. Fernel’s response is of central importance not only to resolving this issue, but also to the question of the soul-body union not only in Fernel’s work, but also Descartes’. Eudoxus, who is Fernel’s mouthpiece, responds to Brutus by saying:

For even if we use the same name for the bone of each, both dog and mule, bone should not be regarded as associated with that same form and basis; indeed, the bones of different animals are distinct, and more widely so than bone and flesh of the same animal. The natural force that exerts control over a dog bone cannot govern an ass’s bones, and yet it regulates the dog’s cartilage and flesh as much as its bone. If you are prepared to think straight about this resemblance of parts, what needs to be reckoned is, as I said before, not the temperament or thickness of the substance, but its own special property, and the spirit that makes it ready in a special way for the arrival of form.\textsuperscript{98}

The great mystery that follows from this explanation is what is this ‘natural force’ or ‘spirit’ that unites the diverse parts of the body to receive its form. Fernel devotes much of his attention to this question not only in Book 1 of \textit{Hidden Causes}, but also throughout his \textit{Physiologia}. Yet what is most important to comprehend from the outset, and it is implicated in the previous quote, is that matter is not strictly passive, as it has some ‘force’ which readies it to receive a certain form. This force is not the essence of the being, nor is it completely uniform throughout all of nature. The matter of each organism, be it a dog, a mule, or a man, has a particular disposition or amenability to receive an appropriate form, and this amenability preexists the form that is said to differentiate the material. As we saw in the previous chapter, such was the case with Suarez as well. With help from Des Chene’s work, we know that Suarez defines dispositions as, “a property which is per se and first of all ordered to an operation (unlike substantial form), not however as a primary power of acting, but as assisting and facilitating the actualization of such a

\textsuperscript{98} Ibid
power.”\textsuperscript{99} Matter is not bare matter: “Thus the parts really contribute something to the form of the whole, but not its essence.”\textsuperscript{100} This will be the role of spirit in Fernel’s work, fitting somewhere between an organism’s essence and the bare arrangement of its parts.

Fernel does not use the word ‘dispositio’ in Hidden Causes, preferring instead the term \textit{accomodata}, but the terms function in essentially the same way; that is, substantial form is the term reserved for that active power which demarcates specific things, individuating them and furnishing them with a certain behavior, while matter is used to denote that which underlies the form, being the subject of these dispositions that allow the form to operate.\textsuperscript{101} Fernel’s position on the conjunction of form and matter is summarized nicely by Leon Figard when he writes,

The form comes to determine and animate the material, but it can only do that when the material has been prepared to receive the form. The form is therefore the correlative of the material, and the two principles mutually condition each other. A certain form can only be introduced into a certain material, and the form is only what it is in its relation to the material where it resides. In living beings for example, the union of the soul and the body, which constitutes life, is not the result of a sudden invasion of the soul into the heart of an inert material.\textsuperscript{102}

Matter is not inert in the conjunction of soul and body; rather, the union of the two is made possible by the dispositions that ‘predispose’ matter to receive a certain form.

We have already gone a long way towards understanding Descartes’ notion of the soul-body union as a substantial form, and why he might write to Regius in December of 1641, “It may be objected that for a human body to be joined to a soul, it is not inessential but its very


\textsuperscript{102} Figard, Leon. \textit{Un médecin philosophe au XV\textsuperscript{e} siècle; étude sur la psychologie de Jean Fernel.} Paris, F. Alcan, 1903. p. 157-8
nature; because if a body has all the dispositions required to receive a soul, which it must have if it is strictly a human body, then short of a miracle it must be united to a soul.”\textsuperscript{103} But the more patience we have with Fernel’s work on the mind-body union, the better prepared we will be to both understand Descartes and see in what ways he diverges from the other masters of his epoch. To understand what these ‘dispositions’ or ‘accomodations’ are in the body, let us turn back to Fernel’s \textit{Hidden Causes} to ask, in just what way is the human body prepared to receive a form?

Fernel responds, “In the bodies of all living things, at least three preparations must be in place for the reception of form.”\textsuperscript{104} The first of these is “a proper and suitable temperament”\textsuperscript{105} while the second is “a harmonious combining, accord, and adaption” of each organic part.\textsuperscript{106} However, these are not as essential as the third, which Fernel states is “a spirit pervading the whole, in which the salutary vital heat resides.”\textsuperscript{107} This vital heat is most significant because “it derives the beginnings of its origin from the seed, more obviously and prominently than the others do.”\textsuperscript{108} The significance of this vital heat will be a major topic of his \textit{Physiologia}, comprising all of Book 4 of that text. Fernel provides few details regarding the nature of this vital heat in Book 1 of \textit{Hidden Causes} beyond the assertion that it is the most significant preparation for the reception of form into the organism. He saves a more detailed treatment of the topic for the early chapters of Book 2, and in the \textit{Physiologia}, where he advertises that “a fuller treatment of the innate heat and spirits is needed, and were the motives for this book.”\textsuperscript{109}

Fernel is aware that many physicians before him have claimed that life is associated with an innate heat, Aristotle and Galen being by far the most famous, and that “all living things live

\textsuperscript{103} AT III 459
\textsuperscript{105} Ibid
\textsuperscript{106} Ibid
\textsuperscript{107} Ibid, 215
\textsuperscript{108} Ibid, 221
\textsuperscript{109} Ibid, 283
by means of the heat enclosed within them.”\textsuperscript{110} This heat is not only the essence of life, but it is also the very definition of nature itself.\textsuperscript{111} However, this heat cannot sustain the life of the organism on its own, and it necessarily must be accompanied by a counterpart that prevents this heat from drying up the material of the body and burning it. This counterpart is what Fernel calls the “original moisture,” which is present in the organism as a kind of fuel for the innate heat.\textsuperscript{112}

Following Hippocrates, who had theorized that as the body becomes older it also becomes drier, ultimately becoming cold, Fernel conceives this original moisture in a dynamic and integral relation to the vital heat. That is to say, the moisture serves as a kind of fuel such that the higher the degree of heat in the body, the more moisture must be present, but as the moisture is consumed by the heat, the moisture and subsequently the heat fade until the point of death, where the body is both dry and cold. This creates a kind of self-degeneration or autoimmune situation in the life of the organism:

[S]ince as the fuel is consumed and the heat is destroyed with it, if the heat is the reason the fuel is expended, and indeed it is, it will become the direct cause of its own extinction. It is happy in its association with the moistness, and if it does not aim at its extinction, it inevitably produces it; with the moistness gone, the result is the heat’s removal. Hence this heat naturally needs to be preserved and perfected, yet makes of itself, and brings about its own decease without meaning to … Therefore the causes of our coming into being and of our death are not different; whatever brought forth and controls us is what ends our last day by death.\textsuperscript{113}

This vital heat has an essential relation to the spirits that Fernel has been quoted as saying form the crucial disposition for the reception of form. Any understanding of the soul-body union

\textsuperscript{110} Ibid, 257
\textsuperscript{111} Ibid, 281
\textsuperscript{112} “[Vital heat] is nourished and supported by a fatty humor very like oil, not the fat with which we see very many parts coated, but a very different one, airy, that when packed into the substance of the similar parts escapes the keenest gaze, but can be detached by diligent skill, as we announced before.” Fernel, Jean. \textit{The Physiologia of Jean Fernel}. Translated by John M. Forrester. American Philosophical Society: Philadelphia. 2003. p.271.

in Fernel’s work must grapple with Fernel’s somewhat difficult thinking on the nature of spirit. The notion of spirit as the ‘third term’ between soul and body has a long history, going back to the Greeks, and is of course one of the most famous and controversial aspects of Descartes’ soul-body physiology. Fernel’s writing on spirit seems a bit clumsy at times, and often it can seem out of place in his otherwise rigorously empirical treatments of the body. However, the doctrine does find its support in such authorities as Galen and Aristotle, and Fernel attempts to give sound arguments for the existence and role of spirits in the body.

In Fernel’s works, there are in fact several different kinds of spirits, each of which plays a specific role in organic processes. There are natural spirits that are formed in the liver from digested food, and which mediate the functions of the nutritive and vegetative soul. Vital spirits are formed in the left part of the heart out of blood and oxygen, and these spirits perform the task of distributing heat throughout the body by travelling through the arterial system. The animal spirits are formed out of these vital spirits in the brain, and as in Descartes, the animal spirits travel through the nervous system and muscles to facilitate motion and sensation. However, in addition to these spirits Fernel posits a fourth, more fundamental, type of spirit, called the celestial or divine spirit. It carries the innate heat and serves as the ultimate source of all vital functions. As we shall see, the divine spirit seems to defy categorization because although it is said to be of divine origin, and hence produced, it is nevertheless present in the male semen, and hence educed from the father. Yet it is precisely this confused, dual nature that allows Fernel to situate the divine spirit as the crucial disposition that unites soul and body.

In the 16th century, there was little controversy over whether or not the body was filled with spirits, but that these spirits were divine was by no means agreed upon, particularly in the

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medical context. Fernel provides two arguments for the existence of a divine spirit and the role it plays in relation to the vital heat and the soul. To say that the vital heat serves as the source of all life, plants and animals included, might mean to say that the element of fire is the primary component of life. This element, like all elements, is a this-worldly phenomenon and has no divinity to it at all. Thus in proving the divinity of spirit, Fernel is most concerned with denying the claim that the vital heat is of a mundane origin. He does this through two arguments. First, if heat is the principle of life, how do we explain organisms with a cold temperament, such as snakes and plants? These emit no heat, and yet they are living beings. If heat is in fact the source of life, then it must transcend the elements that combine to make the temperaments, and thus the vital heat must not be elemental fire. Second, living things beget offspring, and we see that elemental fire begets no living being. If fire is the principle of life, then how can its parts beget nothing? Fernel acknowledges that this argument comes from Aristotle’s *De Generatione*, where he writes, “All have in their semen that which causes it to be productive; I mean what is called vital heat. This is not fire nor any such force.”

Thus, as the principle of life, this divine spirit and the heat it engenders underpins all of the organisms vital functions, including reproduction. Yet, insofar as it is present in reproduction, Fernel understands that it cannot enter the body from its divine source after the organism has been educed from the seed: spirit must be divine and present in the parents as an accident. Fernel supports this view with the authority of Alexander of Aphrodisias, whom he quotes at length, including the following: “For there is resident in the seed of everything

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something that renders the seed fertile, evidently what is termed heat, and it is not fire, it is not some such faculty, but is the spirit that is enclosed in the seed and the foamy body, and the nature in that spirit, corresponding to the element of the stars. “\(^{118}\) Even though the spirit and its heat are not elemental, it is nevertheless found in the seed of the male. This aspect of spirit gives it its corporeal nature, but on account of its divinity or celestial nature, it is not entirely corporeal. Accordingly, in Fernel’s thought, the semen itself has a kind of composite nature, being composed both of matter as well as a “creative faculty, which is all ethereal and full of spirit.”\(^ {119}\) A closer analysis of the semen will be the task of the next chapter.

Vital spirit has a kind of neither/both status in Fernel’s work. It is neither corporeal nor incorporeal, and yet it “is in the middle between the two and has a share of each.”\(^ {120}\) Its divine aspect is crucial for its relation to the soul, since the soul itself is absolutely divine, having no share of the material world. Because the vital heat is both divine and corporeal, it serves as the perfect go-between to unite these two substances, or in Fernel’s words, “[I]t is exceedingly intimate with both, and not being devoid of body, can be placed in a coarse body. But being more rarefied and bright it can be linked to the mind. Sharing thus in both after a fashion, it bonds a nature without body to corporeal nature, the immortal to the mortal, the pure to the impure, the divine to the earthly.”\(^ {121}\) It is for this reason that Fernel posits heat as the crucial disposition for the reception of the soul: its “midway state”\(^ {122}\) makes spirit able to relate both substances, and this status is gained precisely because spirit seems to be both educated as an


accident from the seed of the parents and produced from the divine realm, and on account of its dual generation, spirit can account for the ultimate generation of a divine rational soul with a mundane, composite body.

This interpretation is substantiated throughout Fernel’s discussion of conception, the development of the seed, and the maturation of the fetus, where he is at pains to deny that the form is immanent to the body and educed from matter. Fernel is clear in both the Physiologia and Hidden Causes that the human soul, which is defined by its intellectual capacity, does not emerge from the development of the seed that is driven by this vital heat. In Hidden Causes, Brutus, always the antagonist, states the position that would situate the substantial form within the seed:

I am influenced by the argument that when I see the form itself being derived from potentiality, it must not be taken as a different basis and kind, but must be something of the form, incomplete or as it were stunted. And when it was said to be present in the seed in potentiality only, I regard it as having lain low and inactive. But when it starts to reveal itself by its excellences, and to be manifest through its functioning, then we said it was finally present in actuality, although it has not changed its original form; slender and scanty it might in fact be, but it occupied the substance.123

In Hidden Causes, Fernel agrees that the parts of the body develop slowly out of the seed, but following Suarez, the human form itself is not educed from matter. Rather, “a form is introduced complete, all at once, none of it having been there previously.”124 As Fernel makes clear, the only aspect of the substantial union of soul and body that is transmitted through sexual reproduction is the matter and its disposition that prepare it to receive the human form:

Again, in the generation of animals, seed after its conception is propelled into activity by the power of the amiable heat of the womb, not in order to rouse or emit from itself an animal, but simply in order that its stimulated or propelled potentiality and faculty, with later augmentation, can provide the substrate matter with every kind of preparations, so

123 Ibid, 241
124 Ibid, 277; See also 243
that the form finally gets a share of substance and is inserted from outside; when received, it is suitably preserved and on its way to perform all its subsequent functions.125

However, this picture becomes a bit less clear when we turn to the Physiologia. Here Fernel admits that the nutritive and sensitive souls, proper to plants and animals respectively, are contributed by the seed at birth, while the intelligent soul alone transcends sexual generation. In his opening discussion of the intelligent soul, which he calls mens,126 he states that it is this faculty alone that separates man from the animals. What makes the intelligent soul distinct from the nutritive and sentient souls is that the former is “detached from all material of the body.”127 Being detached in this way, Fernel describes mens as follows: “And so intelligence is uncomplicated, incorporeal, separate, impassive, immortal, and eternal, closely resembling God, divinely conveyed to man from outside.”128 Following the basic framework of his Hidden Causes, Fernel attempts to describe how the preparations of the body that welcome the soul are present in the fetus, and develop out of the nutritive soul, but the mind, which is of a separate nature and imposed from outside, gets no contribution from sexual reproduction.

Fernel addresses the details of this in Book 7 of the Physiologia, which is entitled “On Human Procreation and the Semen.” As he had stated before, the soul is conveyed from outside and it unites with the body because the fetus brings about a “preparation of the body, and tempering and association of the parts, and it either evokes the divine mind and the faculty of reason, or at least it admits it and preserves it as suitable and appropriate for the carrying on of all functions.”129 Again echoing the basic framework of the Hidden Causes, this preparation

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125 Ibid 239, my emphasis; See also 299-301
127 Ibid
128 Ibid
129 Ibid, 599
consists primarily in a heat engendered by the divine spirits, which gives the body the potentiality to become ensouled. These preparations do in fact emerge out of the sentient and nutritive souls, since these souls cannot perform their functions without being ensconced in a body. Thus, unlike the intelligent soul, these lower souls do not move into the soul from outside, but are rather always contained in the seed potentially. In a certain sense, this can be seen to contradict his statements in *Hidden Causes* where he argues that no form is present in any manner in the fetus, and only the dispositions of matter are transmitted by the semen. But Fernel must concede that there is some soul present in the fetal matter not only because the nutritive and sentient souls “need the assistance of a body to act, and so cannot exist without one,” but also because the very actions that these souls perform are the development of the body and it movement. The nutritive soul is particularly important in this sense, since Fernel attributes to this soul the faculties of both procreation and the growth of the body. In every kind [genere] of living creature, the male contributes the exceptional substance of semen; surely likewise he contributes also the soul’s power at the very beginning, along with spirit. At the start [the nutritive soul] lurks in the semen, hidden from the senses, largely undetected during the time when it is said to be present in potentiality. But as time passes, it is roused by the womb’s power, and reveals itself by its action; for presently, as soon as the semen is conceived, the fashioning power comes into operation, which some say is a sort of semblance [“idolum et ideam”] of the generating power.

In contrast to the eduction of the nutritive and sensitive souls, the rational soul, *mens*, is conveyed to the body from outside. In an important summary of the semen, Fernel reiterates that the fertility of the semen consists of the vital heat and moisture that it carries along “in which the whole of life has its dwelling, and in which too there resides the potentiality of the natural and

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130 Ibid, 549
131 See Ibid, 316-317
132 Ibid, 597
nurturing soul, and of the soul that has sensation, movement and appetite.” These elements, along with “the whole of life,” is transmitted by the parents:

Semen has acquired all these outlines of faculties, not from the mixing of elements, but from the parents’ body, in which they exist in actuality [“energia”]. It follows that the man who begets by emitting semen brings forth all the bodily faculties together. But he is not at all [“minimē”] the contributor of the mind [animus] or of its main part which is called the intellect [“mens”]; since the mind [“animus”] differs from the body’s nature, it does not travel with its substance, but glides into it from the outside, a divine gift.\(^{133}\)

Thus, the body and its dispositions are inherited from the parents in the act of sexual generation, but the mind always remains transcendent, an inheritance not from sex, but from God. Similarly, Fernel writes, “But it is mind pure and simple [mens illa simplex] alone, neither provided with nor in need of the earthy bulk of the body, that accrues from outside, and is the only divine soul, because nothing exists in common between its action and the body’s task; the whole power of the soul is a sharer in the other body, which is more divine than the so-called elements.”\(^{134}\) This is the form that Fernel outlines in *Hidden Causes*, and it is not the form of animals or plants, who owe their being entirely to sexual reproduction, but rather the form of man who has his essence conveyed to him not by sex, but from divinity. Fernel believes that this injection of the mind into the properly prepared human body occurs in the fourth month of the infant’s life, “when heart and brain are already brought to completion.”\(^{135}\)

With this in mind, we can return to the *Hidden Causes* and understand more completely just what Fernel means when he articulates the human body as a substantial form. As the *Physiologia* states, the semen of the parents contains within it the vital heat and moisture which is the essential preparation that accommodates the mind. This transmission of the seed and the vital heat is nothing other than the endowment of life itself, as this vital heat contains within it “the

\(^{133}\) Ibid, 553  
\(^{134}\) Ibid, 549  
\(^{135}\) Ibid, 597
whole of life,” but ‘life’ does not include the mind. Consequently, the living thing, as merely living, is a product of sexual reproduction. But this life is merely matter, endowed with certain essential preparations or dispositions, and not a substantial form in and of itself. The human being only exists as a complete and whole substantial form when the mind is joined to these dispositions thanks to God’s divine gift.

Accordingly, in Chapter 7 of Book 1 of the Hidden Causes, entitled, “The form of what has been generated could not emanate from the parents. The character and source of the origin of forms,” Fernel summarizes his theory of substantial forms, of which we will only quote a part. He writes,

But before [the form moves into matter], it is in need of some embellishment and preparation of the matter, through which and without which it could not enter there. This preparation is called a potentiality, which is no part, not even the least [bit], of the approaching form, but, as I said, merely an equipping ahead of form. Anyone who has begotten something is regarded as having contributed this potentiality – sometimes on its own and by itself, sometimes in association with the seed or some seedbed corresponding to it. […] But when the whole preparation is fully complete, at the time when we speak of the perfecting of the potentiality, then the form arrives from outside, through a natural and what you may call inescapable necessity…For the efficient cause and parent, in procreating something else of its own name and kind on his own or through some mediation of seed or seedbed, does not create or inject its form; yet he is the cause of this one merger, namely that the form is in the matter. And this is what is taken as being the cause of the begotten thing, and as having begotten it; but above that there is surely a higher and more excellent craftsman, blowing in the form from outside as if by breath. 

Let us summarize Fernel’s basic position as follows: Nature is composed of discrete things which are defined according their form. This form inheres in matter, but this matter is not bare matter, nor is it strictly passive. Rather, it is endowed with certain preparations, and in regards to the human being, the most essential of these preparations is the vital heat that is accompanied by a kind of moisture. This heat, along with other aspects of the body are indeed transmitted by the parents and this heat is said to reside in the semen. This is ‘life’ insofar as the heat is what

\[\text{Ibid 299-301}\]
sustains life, and it disappears when the organism dies. But this ‘life’, which is primarily constituted by certain dispositions or accommodations is not the essence of the human being. This essence is its form, and the form is not conveyed to man from the parents, but rather it is inherited from divinity, and thus the essence of human being emanates from an other-worldly, transcendent source. The union of transcendent soul and mundane body resides in the spirits of the vital heat, as spirits are both natural and supernatural, and can thus mediate between body and mind.

The Blood as the Principle of Life in William Harvey’s *De Motu Cordis*

Given Suarez and Fernel’s writings, many of the basic principles of Descartes’ mind-body union are in place. As we shall see, the transcendent source of the soul, the sexual generation of the body’s dispositions, and the soul’s bond with the vital heat and spirits all make their appearance in Descartes work, albeit reinterpreted under the mechanistic paradigm. Putting Fernel and Suarez aside, when Descartes discusses the vital heat it is almost always with the works of William Harvey in mind. Harvey is of course most famous for his discovery of the circulation of the blood in his 1628 text *De Motu Cordis*, although he has other important insights into our topic in his later *De Generatione* and *De Circulatione Sanguinis*. Harvey makes his appearance in several of Descartes’ letters and published physiology texts, but perhaps he is most notable in Section V of the *Discourse on Method*, which Descartes devotes almost entirely to the functioning of the heart and Harvey’s anatomical methods. In this section, we must understand just how Harvey conceived the functioning of the heart, the circulation of the blood, and the source of heat in the body in order to understand Descartes’ points of agreement, and more importantly, his criticisms. As we shall see, although Harvey makes several key
breakthroughs in anatomy, his thought still resides in the Scholastic world, relying heavily on the doctrine of material tendencies and substantial forms. However, in spite of this major discrepancy with Descartes’ thinking, Harvey’s rearticulation of spirit’s divinity, making it identical with the blood, stands as an important contribution to Descartes’ physiology of the soul-body union.

Following Galen’s work, specifically his *De Usu Partum*, the heart was still thought to be a respiratory organ in Harvey’s time. Galen believed that the diastole of the heart was an action in which the heart sucked in both blood and air, and then passed this mixture onto the left side of the heart where it was used to fuel the innate heat. Against Aristotle’s attempts to distinguish this innate heat from elemental heat, Galen collapses the distinction and believes that the function of both blood and air is to serve as a fuel to the heart.\(^{137}\) This view was basically still intact through Fernel’s work as he followed Galen in asserting that the breath and pulse were functions of the respiratory system alone. Harvey’s research destroyed much of this traditional edifice, as he recognized the role of the blood as a nourishing substance to the entire body, and the role of the heart as propellant to its circulation. Harvey denied that there is any air in the heart or arteries on empirical grounds.

To understand Harvey’s position, let us begin with the basic experience of the heartbeat. Even without dissecting an animal, we can feel that the heart beats outward, and the arteries do the same in time together. When an animal is vivisected we can see not only that the heart beats outward and expands, but also that it contracts and becomes red, while when it expands it becomes white. It had been thought that when the heart expands, thumping against the chest (the systole), that the heart was full of blood and its pulsation was the pumping of blood and air.

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through to the lungs. However, Harvey argues just the opposite: what had been thought the systole is in fact the diastole, and thus it is when the heart constricts and turns deep red that the organ is full of blood and in the diastole the blood is pumped through the body.\(^{138}\) Thus the motion of the heart is really its diastole, and it is this motion that is properly called the pulse, wherein “It continually thrusts that blood forth into the arteries.”\(^{139}\)

On account of this ‘violent’ motion, the blood fills the arteries and goes into the body nourishing all of its parts. It leaves the heart as a nutriment, “warm, perfected, vaporous, full of spirit, and that I may say so, alimentative.”\(^{140}\) But Harvey realized that the arteries carrying blood out to the body would be full while the veins bringing blood back to the heart would be empty, since there is no violent motion to propel blood into the veins from the distant regions of the body back to the heart. Moreover, seeing as the extremities are much colder than the torso, the blood in these regions would coagulate, and without motion, the blood would lose its vital heat and become cold, a condition synonymous with death. Thus, if the blood circulates, it must find a way to return to the heart and “recover its perfection” and once again be “melted” by the heart’s heat. This is a serious problem that Harvey devotes much thought to in *De Motu Cordis*. To resolve this situation, Harvey resorts to a basic Aristotelean polarity, stating that all violent motions have a natural motion opposing it, and in Harvey’s work, the violent motion of the heart is countered by a natural motion of the blood itself whereby it ‘wills’ its way back to the heart on the basis of its own concentric tendency. Harvey writes, “Moreover to this distribution and motion of the blood, violence, and impulsor is requir’d, such as the heart is. To this add, that the blood does easily concentricate and joyn of its own accord to its beginning, as a part to the


\(^{139}\) Ibid, 35

\(^{140}\) Ibid, 59
whole, or as a drop of water spilt upon the table to the whole mass, as it does very swiftly for slendir causes, such as are cold, fear, horror, and the like.”\textsuperscript{141} Thus there is motion unique to both the heart and the blood, the violent motion of the former opposing the natural motion of the latter. Harvey even says that the pulse of the heart moves the blood “against its will,” which is of course precisely the kind of language Descartes targets in his rejection of substantial forms. As Thomas Fuchs points out, even though we do find Harvey using a number of mechanical analogies in his work, most notably when he calls the heart a ‘pump’, it is never seen as mere mechanism as Descartes would have it. The whole system of circulation is not conceived as a machine, but rather on the basis of active tendencies inherent in each substance. Just as a Scholastic believes a stone tends toward the center of the earth and this tendency is only overcome by the arm of a thrower, so the blood tends toward the center of the body only to be thrust back to the outer regions. It is a fundamentally Scholastic physiology.\textsuperscript{142}

The blood circling through the body is not the only kind of circulation that is important to Harvey. Beyond this directional circulation is a kind of qualitative circulation whereby the depleted blood wills its way back to the heart to be refreshed and then sent back out again to nourish all the organs of the body. This return to the heart is a matter of self-preservation for the blood, for Harvey believes the coagulation and refrigeration of the blood to be a deadly condition. Harvey explains, “Seeing there, that the blood staying in the outward parts is congealed by the cold of the extremities and ambient air, and is destitute of spirits, as it is in dead things, it was needful it should resume and reintegrate, by its return again, as well as heat and spirits, and needed its own preservation, from its own fountain and beginning.”\textsuperscript{143} But not only is

\begin{itemize}
\item \textsuperscript{141} Ibid, 95
\item \textsuperscript{142} Fuchs, Thomas. \textit{The Mechanization of the Heart: Harvey and Descartes}. Translated by Marjorie Greene. University of Rochester Press: Rochester, NY. 2001. p. 48
\item \textsuperscript{143} Harvey, William. \textit{The Anatomical Excerises}. Edited by Geoffrey Keynes. Dover: NY. 1995. p. 93
\end{itemize}
the blood preserved by the heat of the heart, all of the body, including the heart, is preserved by
the blood’s nourishing heat and spirit. Thus as Fuchs explains, it is not only a directional circle,
but also a functional circle, whereby the functions and qualities of blood and heart maintain each
other. Fuchs summarizes this aspect of Harvey’s theory nicely when he writes,

Thus the qualitative-vital aspect of the motion of the heart and blood also closes in a
circle: heat makes possible the motion of the heart, this in turn produces and maintains
heat in the blood: calor > motus > calor. The efficient and final causes of the circulation
are indissolubly bound with one other in the heat of the moving blood as principle of
life.144

In keeping with tradition, Harvey illustrates these different types of circulation through
meteorological analogies, invoking the water cycle. It is the sun, by its warmth, that moves the
water on earth and draws it up towards the sky only to return again and nourish the flora and
fauna of earth, and this cycle is the foundation of life. In Harvey’s words,

Which motion we may call circular, after the same manner that Aristotle says that the rain
and the air do imitate the motion of the superior bodies. For the earth being wet,
evaporates by the heat of the Sun, and the vapours being rais’d aloft are condens’d and
descend in showrs and wet ground, and by this means here are generated, likewise,
tempests, and the beginning of meteors, from the circular motion of the Sun and his
approach and removal […] So the heart is the beginning of life, the Sun of the
Microcosm, as proportionably the Sun deserves to be call’d the heart of world, by whose
virtue and pulsation, the blood is mov’d, perfected, made vegetable, and is defended from
corruption and mattering.145

This analogy between the heart and the sun, as well as matter’s circular motion can be found
almost ubiquitously throughout this period, but it is believed to first appear in the Timeaus.146

However, Harvey himself cites another source, Stephan Rodicerus Castro from his 1621 text, De
meteoris microcosmi. Pagel’s scholarship on this matter places the reference in a letter from

144 Fuchs, Thomas. The Mechanization of the Heart: Harvey and Descartes. Translated by Marjorie Greene.
Harvey to John Beverwijck in 1638. In this text, Castro asserts that in order to be a true physician and a true philosopher, one must recognize the parallels between the celestial sphere and the body. In this text, which Harvey claims to be very fond of, Castro writes of “the heart which sparkles in the center like the sun which cherishes everything through its rays”\(^{147}\) As a self-regulating, autonomous system, Harvey and his peers recognize a basic analogy between the circulation of the blood and the eternal motion of the stars and the Sun; these thinkers institute astronomy as a principle of anatomy complete with Sun’s attractive force, the circular motion of the bodies around the heavens, and, in Harvey’s case, the cycle of water which returns to the sun only to be pushed back to earth for the purpose of nourishment.

However, Harvey departs from the analogy of the Sun in one critical way: the actual heat of life itself is not a property of the heart, although the heart is the hottest organ. On Harvey’s account, the vital heat is in fact a property of the blood. The blood, and not the heart is the source of the innate heat crucial to life. Moreover, in contrast to thinkers like Fernel, the heat and spirits unique to the blood do not themselves derive from the celestial sphere, but are instead identical with the blood. This is most clear in his *De Circulatione Sanguinis* and *De Generatione*, where Harvey writes,

> There is, in fact, no occasion for searching after spirits foreign to, or distinct from, the blood; to evoke heat from another source; to bring gods upon the scene and to encumber philosophy with any fanciful conceits; what we are wont to derive from the stars is in truth produced at home: the blood is the only *caldimum innatum*, or first engendered animal heat; a fact which so clearly appears from our observations on animal reproduction, particularly of the chick from the egg, that it seems superfluous to multiply illustrations.\(^{148}\)

I will not indulge any digressions into Harvey’s views on generation, but merely note here that in this statement and others like it, Harvey effectively eliminates the divinity of spirit, and in

\(^{147}\) Ibid, 94
identifying it as a simple material property of blood, he will facilitate Descartes’ assertion that
the animal spirits are mere bodies propelled through the blood and serve as a vital link between
body and soul. Harvey makes this clear when he writes, again in De Generatione, “The tenuity,
subtility, mobility, etc. of the spirits, therefore, bring no kind of advantage more than the blood,
which it seems they constantly accompany, already possess. The blood consequently suffices,
and is adequate to be the immediate instrument of the soul, inasmuch as it is everywhere present,
and moves hither and thither with the greatest rapidity.”149

We might read these passages and applaud Harvey for using empirical methods to
debunk Fernel’s theory of spirit. Yet however hard Harvey tried to reject metaphysical spirits in
the realm of physiology, he remained beholden to something very much like them in his notion
of the blood. In De generatione, spirits are rejected only to have blood take their place along
with all of their functions, including their divine and celestial nature. Harvey writes of the blood
that it features “a nature analogous to the element of the stars.”150 Insofar as the blood both forms
the body and has this supernatural nature, it is the go-between bonding soul and body: “Indeed it
is blood in which the vegetative and sensitive activities first shine forth; into which heat, the
primary and immediate instrument of the soul, is born; which is the common bond (vinculum) of
body and soul; and by which, as a vehicle, the soul influences all parts of the body.”151

In his critique, Harvey is not so much at odds with the idea that the body unites with the
soul on the basis of some type of celestial or divine matter, he just took issue with designating
that function to spirit, which eluded any observation. In Harvey’s mind it must be the blood that

151 Ibid
unites soul and body on account of its dual nature, and thus we can conclude that it is the blood which should be called ‘spirit’.  

In summary, by eliminating the heart from the respiratory system, Harvey discovers the circulation of the blood through the body as well the body’s means of preserving itself in its autonomous functioning. However, as new as these ideas were, they still rested upon a premodern physics that posited innate tendencies in bodies, and final causes, most notably the vis pulsifica of the heart and the centripetal tendencies of the blood. These two tendencies together constitute the basic principles of Harvey’s theory of circulation, principles that Descartes will consistently take issue with. Moreover, the metaphysical properties of the blood extend well beyond its tendency to return to the heart: the blood has a peculiar nature in which it is both a member of the corporeal and the divine realms. As such, it is the blood and not the spirit that join soul and body. This is a position that stands in contrast to Fernel, but after having completely reconceived the nature of the blood, Descartes ultimately sides with Harvey on this point in The Passions of the Soul.

The Mechanization of Dispositions in Descartes

Descartes read De Motu Cordis in 1632 and he mentions Harvey by name in several of his published writings as well as his correspondence. Descartes came to hear of Harvey’s work through his friend and correspondent, Marin Mersenne. Gassendi had read De Motu Cordis in 1629, the year after the text was published. Gassendi was very attracted to Harvey’s idea of circulation, but he had disagreements about how he believed the heart functioned. Gassendi sent

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152 Ibid
this criticism to Mersenne, who in turn brought up the topic with Descartes, ultimately leading Descartes to read the book in 1632.\textsuperscript{154} At the time that Descartes studied Harvey’s work, he was working on his \textit{Traité de L’homme}, which is one of his most prolonged engagements with human anatomy. However, his most extensive discussion of Harvey’s work comes in his 1637 \textit{Discourse on Method}, where in Part V Descartes takes up the example of the heart to illustrate his understanding of a properly scientific method. Descartes devotes a full paragraph of this section of the \textit{Discourse} to a summary and conditional approval of Harvey’s theory of the circulation of the blood and his methods of demonstration.\textsuperscript{155}

Although Descartes does endorse Harvey’s work in the \textit{De motu cordis}, his endorsement is not unequivocal. As he writes in a letter to Mersenne from late in the year of 1632, “I saw the book \textit{De motu cordis} that you spoke to me about and I found myself differing from his opinion a bit, although I had only seen it after having managed to write about this material.”\textsuperscript{156} Descartes ends the letter there and does not expound upon just what this difference of opinion consists in. In another letter to Mersenne from February 9, 1639, Descartes again states that he is not completely in accord with Harvey’s work, and that only those who do the most cursory reading of his physiology could think that he had written the same thing as Harvey. But in fact, they are only led to believe this because of their agreement on the circulation of the blood, when according to Descartes, “I explain all that belongs to the movement of the heart in a way that is entirely contrary to his.”\textsuperscript{157} Finally, in the \textit{Description of the Human Body} from 1648, Descartes repeats once again that Harvey has “not so well succeeded in that which concerns the movement

\begin{itemize}
  \item \textsuperscript{155} AT VI 46-50
  \item \textsuperscript{156} AT I, 263
  \item \textsuperscript{157} AT II, 501
\end{itemize}
of the heart.”\textsuperscript{158} Thus, in his letters Descartes explicitly denies that his explanation of the heart is Harvey’s.

Just what does this point of disagreement consist in? As Gilson explains in his essay “Descartes, Harvey et la Scholastique,” all of Descartes’ disagreements with Harvey stem from the fact that Harvey fundamentally misunderstands the role of the heat of the heart, and the role that it plays in the life of the organism. Against many of his contemporaries, including not only Harvey, but also Plempius and Fromondus, Descartes believes that the primary aspect of the heart is a vital heat that resides in the walls of the flesh, and it is through this heat that the heart warms the blood that passes through it and is pumped to the rest of the body. The heart therefore heats the entire body through the intermediary of the blood.\textsuperscript{159} Both Descartes and Harvey agree on this point, and in doing so they both see themselves following the Aristotelian tradition.\textsuperscript{160} However, while Harvey follows Aristotle’s \textit{De Respiratione} almost point by point on this matter, Descartes insists that this heat of the heart is due to strictly mechanical causes. He introduces a ‘feu sans lumiere’ that is responsible for heating the heart and in turn the body. In tracing his criticism, we should keep in mind that Harvey’s conception of the blood is a critique of Fernel’s vital spirits. Yet in both thinkers the crucial role of mediating between soul and body is performed by a kind of heat. Descartes is no different on this point, as this ‘feu sans lumiere’ and the blood that fuels it is the primary disposition accommodating the soul.

As Gilson explains, the situation in Descartes’ writing regarding the vital heat, the heart, and the blood is as follows:

\textsuperscript{158} AT XI, 241
\textsuperscript{159} AT VI, 49-51; See also Gilson, \textit{Étienne. Études sur le role de la pensée médiévale dans la formation du système cartésien}. Paris: J. Vrin. 1951. p. 82-3
Descartes considers the heart as a kind of hearth that would be the place of a very intense heat; it is this heat that warms the blood at the moment of its passage, and which, in the same way, maintains the heat of the entire body. In order to give life to the human body, God did not have to join it to a vegetative or sensitive soul, but simply to excite in the walls of the heart this heat that is the origin of all the functions of the human body.\textsuperscript{161}

In the \textit{Passions of the Soul}, Descartes begins by stating that one of the key errors we have made in understanding the passions is that we have mistakenly thought that all the movements of the body, as well as its heat, are dependent upon the soul. In contrast, Descartes believes that when we die it is not because the soul leaves the body, but rather the soul only leaves the body when this innate heat ceases.\textsuperscript{162} He had stated this already in the \textit{Description of the Human Body}, where he notes the error in “believing that the soul in the principle of all” movements.\textsuperscript{163} He goes on to say in the \textit{Passions of the Soul} that this “continual heat in the heart” is the “corporeal principle of all the movements of our parts.”\textsuperscript{164} In Article 107, he will declare that this heat is the “principle of life.”

This is significant, not only because it provides an insight into how Descartes defines ‘life’, but also because Descartes situates this heat located in the heart at the centerpiece of the mind-body union, thus following in the footsteps of Fernel who declared that this vital heat serves as the primary accommodation for the arrival of the intelligent soul. In this same paragraph of the \textit{Passions of the Soul} where he announces that this heat in the heart is the principle of life, Descartes states how the union of soul and body is instituted on the model of a substantial form according to a certain disposition of the blood or some other fuel that maintains this heat. As Descartes writes to Regius in January of 1642, he agrees with Fernel and Suarez, that the “human being is made up of body and soul, not by the mere presence or proximity of one

\textsuperscript{161} Ibid 82
\textsuperscript{162} AT XI, 330-1
\textsuperscript{163} AT XI, 224
\textsuperscript{164} AT XI, 332
to the other, but by a true substantial union. For this there is, indeed, required a natural disposition of the body and the appropriate configuration of its parts."\textsuperscript{165} As we have seen with Fernel, in the doctrine of substantial forms some dispositions of the body are more significant than others, and even though Descartes will catalogue a number of dispositions in texts such as his \textit{Treatise on Man}, the most significant disposition is the vital heat of the heart and the moisture which sustains it. As Descartes explains in a letter to Mesland from 1645 or 1646 (the date is uncertain), the union of mind and body essentially concerns the blood more than any other aspect of the body, even the pineal gland: “The soul is however only united to the body in virtue of the dispositions that it has to be united with the human blood, and not in virtue of the dispositions of the flesh.”\textsuperscript{166} Nowhere is this position more clear than in the aforementioned Article 107 of the \textit{Passions}: “[I]t seems to me that when our soul began to be joined to our body, its first passions must have arisen on some occasion when the blood, or some other juice entering the heart, was a more suitable fuel than usual for maintaining the heat of the heart.”\textsuperscript{167} Understanding this passage is paramount to comprehending what Descartes means when he states that the human soul is the only substantial form in nature.

The primary task that Descartes is faced with is how he will rearticulate the heat of the heart and its movement in strictly mechanistic terms. We know that when Descartes explains the body in ‘mechanistic terms’ he means simply that the body, \textit{qua} body, is comprehensible on the basis of no other form but extension and the movement of its particles. The concluding lines of \textit{Le Monde} read:

\begin{quote}
I desire, I say, that you consider that these functions follow completely naturally, in this Machine, from only the disposition of its organs, no more and no less than those dispositions that make the movements of a watch, or another automaton, from its
\end{quote}

\textsuperscript{165} AT III 491
\textsuperscript{166} AT IV, 347
\textsuperscript{167} AT XI, 407
counterweights and wheels; in the way that it is not at all necessary in their case to conceive of any other vegetative nor sensitive Soul, nor any other principle of movement and of life, than its blood and its sprits, activated by the heat of the fire that continually burns in the heart, and which is of no other nature than all the fires that are in inanimate bodies.\textsuperscript{168}

Thus, the blood and the heat in the heart are not anything peculiar to living beings, but rather the principle of life is the same phenomenon that is found in any fire. This fire is \textit{a feu sans lumière}, and at other places Descartes details how it functions in the walls of the heart. Continuing to insist that this ‘principle of life’ has nothing mysterious or metaphysical about it, Descartes argues that it is in fact a kind of combustion through fermentation. In attempting to explain this, he writes that this heat is not “at all of another nature than that which heats hay, when we have stored it before it was dry, or that boils new wines when we leave them to rest on the grater.”\textsuperscript{169}

Similarly, in the \textit{Description}, he makes another connection with inanimate processes of fermentation writing, “We cannot doubt that there is a heat in the heart, because we can even feel it with our hand when we open the body of a living animal. And it is not necessary to imagine that this heat is of another nature than is generally all those that are caused by the mixing of a liqueur or agent of fermentation…”\textsuperscript{170} In the \textit{Discourse}, he repeats this thought, writing, “[God] excited in its heart one of these fires without light which I had already explained, and which I conceived to be of the same nature as that which heats grain, when we store it before it is dry, or which makes new wines boil, when we leave to ferment in the pulp.”\textsuperscript{171}

This is not an analogy, but nor is it the case that Descartes believes that the heart actually contains warm hay, or fermenting wine. In order to understand the mechanism of this \textit{feu sans}

\begin{footnotesize}
\begin{itemize}
\item \textsuperscript{168} AT XI, 202
\item \textsuperscript{169} AT VI, 46
\item \textsuperscript{170} AT XI 228
\item \textsuperscript{171} AT VI, 46
\end{itemize}
\end{footnotesize}
lumiere in the pores of the heart we must look back at the *Principles* and some of Descartes’ more general statements on matter, air, fire, and the motion of particles.

In Book IV of the *Principles* Descartes devotes an entire section, Section 94, to this specific fire, taking the example of wet hay as his illustration. We learn in that passage that the fire kindled in wet hay results from an agitation of the first and second elements. In Descartes’ physics, because all matter is uniform, having the same nature and obeying the same laws, the different qualities and characteristics of things result from motion. This is no different in the case of the human body.\(^{172}\) Descartes posits three different elements with their own size and shape, which permits them to be moved more or less rapidly. The universe is completely full of these elements, with no void whatsoever. Because there is no void, Descartes deduces that all bodies move only by moving in a complete circuit. Following his argument that all space is occupied by extended bodies, he writes,

> From this it follows that no body can move except in a {complete} circle {of matter or ring of bodies which all move at the same time}; in such a way that it drives another body out of the place which it enters, and that other takes the place of still another, and so on until the last, which enters the place left by the first one at the moment at which the first one leaves it.\(^{173}\)

This is in fact how the entire universe moves: each part moves by pushing the part next to it, and this goes on in a chain reaction until all the parts have rotated. For example, when tea is stirred in a pitcher the spoon only directly touches a small part of all the liquid, yet all the liquid is pushed and rotates around in a circular motion. We shall see, this is not only how the stars rotate but also how the blood circulates.

As a consequence of this continuous rotation of matter, the particles that compose the universe become spherical. For as the parts of matter begin spinning, the force with which they

\(^{172}\) AT XI, 247  
\(^{173}\) AT IX 81
spin and collide is enough to break off their sharp angles and thus, “it was impossible for them not to become spherical with the passing of time because of their various circular motions.” These spheres compose the second element. However, since these are spheres, they must leave a void, as spheres cannot be perfectly joined together. Descartes solves this problem with the introduction of the first element: “these spaces must be filled by certain other scrapings of matter which must be extremely tiny and able to change their shapes at any moment in order to conform to those places they enter.” These particles, which move extremely rapidly and are extremely small, are the element of fire. The second element, which also plays a key role in the feu sans lumiere moves a bit slower, but still is not perceptible, while the third particle constitutes the particles of air, earth, and water. Descartes summarizes the first two elements nicely when he writes,

And so now we have two very different kinds of matter, which can be called the first two elements of the visible world. The first is that of matter which has so much force of agitation that, by colliding with other bodies, it is divided into particles of indefinite smallness, and which adapts its shapes to fill all the narrower parts of the little angles left by others. The second is that of matter which is divided into spherical particles, admittedly very small if compared with those bodies which our eyes can discern; yet of a certain a determined quantity and divisible into others much smaller.

Keeping in mind the qualities of these elements, let us investigate the nature of the heart’s fire. In any fire, the first element plays a crucial role insofar as these particles agitate and direct the movements of the third element such as the latter compose dry wood, wet hay, or the like. In a way, the first element feeds upon the third element, breaking it up, and carrying it away in its extremely rapid movements. In the case of fresh hay, there is a stalk with a pore inside of it, where there is still liquid stored. When this residual water in a pile of hay leaks out of the stalks,
it seeps into another blade of grass by means of pores on the outside of the blade. However, this liquid encounters, “many pores in those blades which are beginning to dry which are slightly too narrow to admit both these juices and the globules of the second element,” and thus with the liquid driving out the second element, we are left only with space for the very tiny particles of the first element which move with this liquid through the pores of the slightly dried hay. But when this wetness is agitated by the first element, these particles strike the stalks of hay very rapidly and with much force, and in so doing “they acquire the agitation of fire.” In this way, the first element particles feed upon the third element particles that make up the hay just as fire feeds upon any flammable material, and the haystack combusts. However, if these first element particles do not have the force to break down the hay and carry them away in a blaze, and instead they merely “agitate” the particles composing the hay, then, “they merely heat and rot the hay slowly, [so there is then in it a sort of fire without light].” Thus, the difference between a full blaze and a mere fire without light lies in the degree of force behind the motion of the first element particles.

Descartes summarizes this process making it applicable as a general principle, when he writes, “whenever some hard body grows hot by the admixture of some liquid, I judge that this occurs because many of the hard body’s pores are of such a measurement as to admit the particles of this liquid, surrounded solely by the matter of the first element.” It is this slight force of ‘agitation’ that God maintains in the pores of the heart as the principle of life. Just as in Fernel, this innate heat must be fueled by some kind of moisture, but unlike Fernel, Descartes does not posit a kind of oily ‘original moisture’. His process requires only a liquid, such as water.

177 Ibid 250
178 Ibid 250
179 Ibid 251
180 Ibid
in the example of wet hay, and in the case of the heart the fuel for its fire is nothing other than the blood itself. As Descartes claims in the Fifth Book of the *Discourse*, the blood is “used to feed the fire in the heart,” and just as the liquid in wet hay pushes out the particles of the second element, so it is with blood, leaving only the first element particles to agitate the pores in the walls of the heart creating a vital heat. As Descartes maintains through his final publication, *The Passions of the Soul*, that it is “the blood, or some other juice entering the heart, was a more suitable fuel than usual for maintaining the heat which is the principle of life.”\(^\text{181}\) In this capacity, Descartes is aligned with Harvey, who positioned the blood as the basis of the heat, and as the mediator between soul and body. Of course, this ‘vital’ heat is not unique to the organic world at all; it is nothing more than the inorganic movement of particles, and ultimately Descartes’ ‘principle of life’ is not an organic principle. Life’s ‘organic’ distinction becomes a casualty of the mechanical view of nature, as the heart and its heat becomes just another kind of machine.

What is the place then of the spirit in this mechanical production of heat? We have seen that in Fernel, this heat is not an elemental heat, but instead it descends into the body from a divine source in the form of spirits. In this theory, it is the spirit that brings heat. In Descartes’ writing, the opposite is the case: it is not the spirits that bring heat to the body, but rather the heat of the heart rarefies the blood and produces the spirits. The *feu sans lumière* is not in the control of spirit or soul, but instead it is the direct result of God’s creative will, which supplies the appropriate amount of force to agitate the particles. The spirits are not present until the blood has been heated and its particles agitated to the point that a kind of flame arises, which is spirit. As Descartes describes them in the *Discourse*, the spirits “resemble a very subtle wind, or rather a flame which is very pure and very vivid.”\(^\text{182}\) These spirits, produced in the heart, rise to the brain

\(^{181}\) AT XI 407  
\(^{182}\) AT VI 54
and are sent out to the nerves and muscles. As in Harvey’s work, these spirits are not distinct from the blood, but instead they are nothing more than the hottest and most agitated parts of the blood, or as Descartes explains, “the parts of the blood that are the most agitated and penetrating and therefore the most appropriate to compose these spirits, go toward the brain rather than other place.”\textsuperscript{183}

Of course, when we look at the literature surrounding the mind-body problem in Descartes, these spirits lie at the center of the controversy. Much has been written to decipher their actions upon and relation to the soul, and for good reason. Yet, without going into that question any further, it is worthwhile to make a final comment on the circulatory system in Descartes, for we know that the spirits and the movement of the blood and heart took on a kind of divine aspect in the works of Fernel and Harvey, and in Descartes this receives a radical reinterpretation.

To understand the circulation of the blood, we must comprehend the pumping action of the heart, and it is on this point that Descartes takes issue with Harvey’s, and ultimately Galen’s, \textit{vis pulsifica}. In Descartes’ physics, there is no place for a blood that ‘wills’ or a heart with a faculty to pump blood. In Descartes’ physiology, the heart has no proper action at all, it rather becomes a strictly passive organ, built to fill with blood and then empty. Descartes offers his best explanation of the mechanism of the heartbeat again in the \textit{Discourse}. Here we learn that the blood enters the heart through two channels: the \textit{vena cava} and the \textit{arteria venosa}. These cavities each dispense a rather large drop of blood in the heart, which becomes hot: “But as soon as two drops of blood enter thus, one in each of its concavities, these drops (which can only be very large, for the openings through which they enter are very wide, and the vessels from which they

\textsuperscript{183} Ibid
come are quite full of blood) become rarefied and dilated, because of the heat they find there."^{184}

As the blood is heated through the pores of the heart, the heart swells to the point that it cannot contain the hot blood, and the blood is forced to escape through the arteries. As this happens, the heart and blood both cool a bit, and in so doing the heart deflates. But not all of the blood passes out – a small bit remains to serve as a catalyst for the next drops of blood to be heated: “some heated blood has remained in the pores between the cardiac fibers, and this now mixes with the blood streaming in from the auricles and serves as ferment for the next reaction.”^{185} As Descartes describes circulation, he not only eliminates the innate power of the heart to pulsate and pump blood, the heart becomes strictly passive in that it is only inflated by the heated blood which presses open the entry ways of the aorta and pulmonary vessel.^{186} Accordingly, Descartes arrives at a strictly mechanical explanation of the heart beat, an accomplishment he was quite proud of. This account rests upon only the organization of the parts of the heart (its pores, opening, and cavities), a kind of heat that is easily experienced, and the nature of the blood, all of which “we can understand through experiment, just as necessarily as does the motion of a clock from the force, situation and shape of its counterweights and wheels.”^{187}

In this way, the blood is forced around the circulatory system without the need of any innate tendencies. The circle is accomplished in just the same way all circular movement is: through the pushing of adjacent particles. The blood that is pushed out of the heart jolts the blood in the rest of the arterial and venal system and creates a chain reaction that sees the blood move back around to the heart. The blood, like the heart, has no spontaneous movement or innate tendency to accomplish anything, rather, the blood merely pushes the blood in front of it around

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^{184} Ibid, 49
^{185} AT XI, 231
^{187} AT VI 50
Although there is nothing in this act that arrives from on high, as in earlier thinkers, it is a mirror image of the movement of the heavens as Descartes conceives it. Like all bodies, the cosmos is filled with particles, and as the sun circles the celestial sphere it carries all these particles along with, and thus the sun acts as a kind of primary impulse that pushes along all the other particles in a circular motion.\(^{189}\) The heart and the sun still share a basic allegiance as the ‘prime mover’ of their respective spheres, but all vitalistic tendencies have been removed from the analogy, and in fact the analogy is not really one at all, as the motion of particles and its laws are, for Descartes, univocal.

In conclusion, what is significant about this explanation as a whole is that this heat in the heart is always produced by some *natural* fermentation and combustion that is based upon a kind of liquid. This liquid is not an original moisture or divine blood. It is merely matter and the motion of certain particles of the blood as it passes through the heart. This follows the basic outlines of Fernel’s theory which states that the vital heat is necessarily accompanied by an original moisture, with the notable exception that Descartes insists that this heat and moisture are not unique to organic beings. This ‘moisture’, the blood, makes the fermentation possible, to which Descartes is referring when he states in the aforementioned section 107 of the *Passions of the Soul* that the soul only joins to the body when “the blood, or some other juice entering the heart, was a more suitable fuel than usual for maintaining the heat which is the principle of life.” Thus, Descartes’ theory agrees with Fernel’s insofar as the substantial union is accomplished on the basis of the disposition of heat and the fuel that necessarily accompanies that heat throughout the life of the organism. However, the next line that immediately follows this assertion in Article 107 remains opaque: “This caused the soul to join itself willingly to that fuel, i.e., to love it.” The

\(^{188}\) AT XI, 126

bond of love between the divinely created soul and the heat of the blood in the heart suggests Descartes’ most fundamental thoughts on the soul-body union. Yet in order to disclose the nature of the bond and the problems concealed within it, we must take our cue from Suarez and Fernel. As we have learned from Suarez’s extensive discussion on generation and Fernel’s probing into the nature of the semen, the conditions of this bond as well as its nature must be pursued through an explanation of generation. On this point, Descartes is no different.

Works Cited


CHAPTER 3
The Generation of the Mind-Body Problem

Given that the rational soul and the body derive from two separate origins, the former from God and the latter from the parents, we are always left with the problem of their union. That the two unite on the basis of some sort of disposition, a kind of heat, is widely agreed upon by Descartes and his immediate predecessors. How the intellect resides in the body, how it was generated, and how the body developed in such a way that it would welcome a soul is less clear. Some, like Fernel, believe that a soul that reached the body from outside can never truly unite with a transient and mortal body. Fernel writes, “Mind is, so to speak, separate and simple, not mingling with the body, but just supervising it as the steerman supervises his ship [Illa quasi separate et simplex, corpora non permiscetur, sed ei duntaxat ut navi gubernator assistit].”

Descartes finds this statement directly opposed to the teachings of nature, writing,

There is nothing that nature teaches me more explicitly than that I have a body that is ill disposed when I feel pain, that needs food and drink when I suffer hunger or thirst, and the like […] By means of these sensations of pain, hunger, thirst, and so on, nature also teaches that I am present in my body not merely in the way a sailor is present in a ship, but that I am most tightly joined and, so to speak, commingled with it, so much so that I and the body constitute one single thing.

This ‘one single thing’ is the substantial union of soul and body.

As we have learned from Suarez, the nature of this union is directly impacted by the generation of form and matter. If the form is educed from matter, then the union is solved, as a form that emerges from matter is already tightly enmeshed. The problem in this case is how the form ever came to distinguish itself. For Descartes and others, the rational soul is not generated

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191 AT VII 81
in this way. As Suarez makes clear, this soul alone is produced by God. As such, its distinction from the body is clear, but its union is in doubt. We have been investigating how this union occurs on the basis of certain dispositions in the body, most notably the heat of the heart. However, the nature of the soul’s union with the heat will remain obscure until we explain its generation. That is the aim of this chapter: to explain the generation of this disposition in the heart, the generation of the soul, and the generation of the union such that they constitute “one single thing”.

The Generation of the Body

With analyses of Descartes’ work on physical generation being scarce, let us start with one of the more well known publications. In his essay, *Machine et Organisme*, Georges Canguilhem offers his analysis of Descartes’ opening lines of his *Traité de l’homme*. In a sense, Descartes does offer a theory of the generation of the body in these passages, writing.

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

I suppose the body to be nothing but a statue or a machine made of earth, which God forms with the explicit intention of making it as much as possible like us. Thus God not only gives it externally the colors and shapes of all the parts of our bodies, but also places inside it all the parts required to make it walk, eat, breathe, enabling it to imitate all those functions which seem to proceed from matter and to depend solely on the interacting movements of the organs.

We see clocks, artificial fountains, mills and other such machines, which although man-made, seem to move of their own accord in various ways; but I am supposing this machine to be made by the hands of God, and so I think you may reasonably think it capable of a greater variety of movements then I could possibly imagine on it, and of exhibiting more artistry than I could possibly ascribe to it.\(^{192}\)

From this passage Canguilhem draws the conclusion that Descartes cannot claim to eliminate final causes from the natural order if God creates the body to mimic a preexisting organism. In his ‘naïve’ reading, he notes that this is a kind of Aristoteleanism:

The text explicitly states that the construction of the living machine is to mimic that of a preexisting organism. The mechanical model assumes a live original. Hence, Descartes in this text may be closer to Aristotle than to Plato. The Platonic demiurge copies Ideas. The Idea is model of which the natural object is a copy. The Cartesian God, *Artifex maximus*, tries to equal the living thing itself. The living machine is modeled on the living thing.\(^\text{193}\)

Accordingly, this account of animal generation does not get beyond teleology, since Descartes cannot explain why machines are built this way in the first place without reference to a final cause.

Yet however accurate this may be, this myth from the *Traité* is not Descartes’ considered account of generation. At the time he wrote this passage, the early 1630’s, he had been studying animal generation, but he did not think himself advanced enough to publish anything on it: “A month ago, I deliberated if I could describe how animal generation occurs in my *Monde*, and finally I made up my mind to do nothing about it, since it would take me too long.”\(^\text{194}\)

Canguilhem’s criticism would be correct if this myth from the *Traité* were Descartes’ final word. But that is hardly the case, and unfortunately things are quite a bit more complicated. Even as Descartes wrote *Le Monde* and the *Traité* he was immersed in the embryological treatises of his contemporaries and hypothesizing the nature of the seed, the formation of the heart, and the role of God.

Descartes’ interest in the question of generation was sustained throughout his philosophical career, and his passion for the subject even led him to conduct his own

\(^{193}\) Ibid, 144-5

\(^{194}\) AT I 254-5
experiments on chicken eggs. Unfortunately, it remains one of the most understudied aspects of his work. Nevertheless, the work of a few scholars interested in the topic such as Vincent Aucante and Stephen Gaukroger have uncovered four sources in Descartes’ corpus that directly address the question of sexual generation, though none of them were published in Descartes lifetime. The *Primae Cogitationes circa generationem animalium* was first published in 1692 in an obscure Dutch translation in conjunction with the *Traité de L’Homme* and *Description du Corps Humain*. The original text was not published until 1701. The *Excerpta anatomica* and *Remedia et vires medicamentorum* both survive thanks to Leibniz who recopied Descartes’ writings into his own notebooks. Finally, the *Description du Corps Humain*, published in 1664 by Clerselier, is perhaps Descartes most sustained investigation of the question. A careful study of these works reveals just how cautious Descartes was in his formulation opening the *Traité*.

In this chapter we will investigate these texts, paying particularly close attention to the *Description* in order to comprehend several significant features of Descartes’ thinking on sexual reproduction and fetal development. Most salient is his mechanical, non-teleological account of the process, which entails a reconception of the semen. By comparing Descartes’ account to his predecessors Fabricius, Harvey, and Fernel, we glimpse how Descartes’ reconception of the semen lays the groundwork for his famously problematic ‘dualism’ between mind and body, a problem that previous conceptions of the semen had rigorously avoided.

Following Aucante, we can classify Descartes’ writings on fetal development into three epochs if we trace his changing views on the order of the formation of the organs. In the early 1630’s Descartes clearly believes that the brain is the first organ to appear in the fetus, a position that he seems to have adopted from Fernel. Although it seems Descartes’ work began by following Fernel’s conclusions, he changed his thinking after studying the embryological work
of Fabricius d’Aquapendente, which inaugurates a second stage in Descartes’ thinking wherein he posits the lungs and liver to be the first organs formed. Finally, in the Description, Descartes decides that the heart is the first organ to appear, a position he adopts from Aristotle. This is the position that Descartes seems to have held when he published his final text, Les passions de l’âme, dealing most explicitly with the union of mind and body. However, as is the case with all of Descartes’ writing, we must look back to his immediate predecessors before we can do a rigorous reading of Descartes’ own writing on the topic. The influential figures writing on animal generation at the time were Fabricius, Fernel, and Harvey, the last being Fabricius’ student while Fabricius was studying and publishing on the topic. We have seen how Descartes was more than familiar with Harvey and Fernel, but we also know that he had studied Fabricius around 1630 and was particularly interested in his De Formatione Ovi et Pulli from 1621. He writes to Mersenne in 1646, “Regarding the formation of chickens in the egg, it was more than 15 years ago that I read what Fabricius ab Aquapendente had written about it.” This would have been in the period when Descartes was working on Le Monde, but as we have mentioned, he never found the time to publish those comments.

We will study each of these three figures in turn, but the most crucial aspect of their thinking, serving as a kind of common thread, is that each understands animal generation to be driven by metaphysical entities toward a final cause. This of course derives from Aristotle’s work, which is still enormously influential at the time. In the Aristotelian paradigm, the objects of nature are defined and classified according to their form. Of course, the form is not the shape of the object, but rather it is the arrangement of its parts for some functional end. As Aristotle himself explains,

195 AT IV 55
Compare the following: if an instrument, e.g. An axe were a natural body, then its substance would be what it is to be an axe, and this would be its soul; if this were removed it would no longer be an axe, except homonymously. But as it is it is an axe; for it is not of this kind of body that the soul is ‘what it is for it to be what it was’ and the principle of a certain kind of natural body having within itself a source of movement and rest.\textsuperscript{196}

We have already discussed at length in the First Chapter what kind of an understanding of nature this thinking carries along with it and how nature must then be studied. Recall that in studying nature, one studies movement and rest, and the most striking form of movement is when an entirely new form comes to be. This sort of coming-to-be in nature can be explained in two ways: according to the “for the sake of which” or the “from which comes the beginning of movement.”\textsuperscript{197} We recognize these explanations as those that proceed according to final causes and those that pursue efficient causes. For Aristotle and the Scholastics, both explanations are possible, but the final cause always takes precedence. All the processes of generation are thought to occur for the sake of some particular sort of being. That is to say, for Aristotle and his followers, in the study of animal generation, we must first know what the animal is before we can understand the process of generation: being precedes generation. In order to understand the process of fetal development, we must first know what the fetus displays the potential to become. Aristotle makes this very clear when he writes, “For coming-to-be is for the sake of being (\textit{ousia}), not being for the sake of coming-to-be […] Hence we should, if possible, say that because this is what it is to be a man, therefore he has these parts; for he cannot be […] And because he is a thing of this sort, his coming-to-be must happen the way it does. That is why this


\textsuperscript{197} Ibid, 639b12
part comes to be first, and then this.” Because of the subordination of becoming to being, Aristotle must understand all generation as goal-directed. This is the one point of agreement that all physiologists of the Scholastic period can agree on, and the one point that Descartes absolutely does not accept at any point in his studies. This is not surprising, but it does have significant consequences for how he must reconceive the process, and ultimately how Descartes can make sense of an ensouled body.

Let us look at Fabricius’ general account of generation as well as Harvey’s comments on the matter to get a better understanding of how metaphysical and teleological thinking dominated the investigations of the fetus in Descartes’ time. Fabricius, though not widely known today, was a prominent figure in his field, serving as a Lecturer on Surgery and Professor of Anatomy at the enormously influential Paduan school from 1565-1613. Beginning in 1613 he was Professor Superordinarius in anatomy. His means of teaching and lecturing were accomplished through public dissection, and if he is known by laypersons today, it is perhaps because his anatomical theater in Padua is a popular tourist site.

Our concerns are with his writings in Chapter 2 of his 1621 De Formatione Ovi et Pulli where he discusses the action of the semen in the hen and the subsequent formation of the chick embryo.

Before we turn to that text, it is interesting to note where Fabricius sees himself in the history of studies on animal generation. Writing in the 1600’s, Fabricius believes that no one since Aristotle has seriously taken up the question of generation, and accordingly, he sees

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himself picking up the topic where Aristotle left off. In his dedication of *The Formed Fetus*, he writes,

> Truly *ta chalepa ta kala*, ‘Difficult things are beautiful’, as the saying goes: no little difficulty attends the eminence of this issue, which difficulty is also increased by the fact that few of the ancients and none at all of the moderns have addressed themselves to this topic. Why this has happened I do not know, since indeed it is unworthy that such great marvels of nature should lie hidden from us. We shall reveal them with as much brevity as we can, and so effect it both by the placing of illustrations and by the plan of exposition, that anyone henceforth may be able to understand and contemplate those first beginnings of the life of every animal. In this way we shall both follow and expound that great interpreter of nature, Aristotle, who first and alone inquired into these mysteries; and if anything at times escaped him, we shall point it out.²⁰⁰

In this dedication, the singular authority granted to Aristotle is clear. It is true that at times Fabricius names other thinkers, but few, if any, are his contemporaries. Fabricius truly feels himself to be recovering a lost question, and the fact that Descartes will begin his own investigation into animal generation scarcely ten years after the publication of Fabricius’ *De formatione* attests to not only the infancy of this discussion in the modern period, but also the enormous influence Aristotle still had. It is an influence that Aristotle accrues almost by default, as the modern investigation into generation is barely off the ground by the time Fabricius, Harvey, and Descartes begin publishing on the topic.

In Fabricius’ *De formatione*, the role of spirit and the heat of the womb in the process of insemination is key to our attempt to historically situate Descartes’ own thinking on animal generation. We will then turn to Harvey’s *De generatione* where Harvey provides some commentary on Fabricius’ work, emphasizing the necessity of teleological thinking in the study of generation.

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²⁰⁰ Ibid, 221
Descartes’ studies on the production of the chicken egg came up against the problem of how the semen could produce the egg and how the egg could subsequently produce the chick. In attempting to resolve this matter he had several precedents available. He might, following Aristotle, think that the male seed was the agent while the maternal blood served as a passive matter with the potency to be formed into an organism. This model, while widely noted for its sexism, was held to be strongly analogous to the production of cheese, wherein milk serves as the passive matter and rennet is the active principle of its curdling and thickening into a solid, formed substance. However, we might take the view that both cock and hen contribute active properties in coitus, and if the cock’s semen is more active than the hen’s, the offspring will carry more paternal traits, mutatis mutandis. Descartes himself wavers on which is the correct path, ultimately deciding on the latter in his Description, positing two active potencies in each sex.

Fabricius decides the point by focusing on the hen’s production of wind-eggs. He notes that when no cock is present, the hen can produce an egg, and even provide the material and nutrition for the egg, yet the egg is not fecund. Thus, semen must somehow mix with the aliment inside the egg in order to produce a new organism. However, Fabricius maintains that the semen cannot penetrate the dense shell of the egg, and thus it never in fact mixes with the egg. Rather, the semen remains in the uterus, never penetrating the egg itself. This creates the strange scenario that Fabricius struggles to clarify in which the semen is the agent of reproduction, but it never seems to mingle with the egg. Because the semen cannot penetrate the egg and the egg is not fertile without the semen, Fabricius must invoke a third element to bring the passive, infertile egg into contact with the semen. This element is spirit.
Spirit must accompany the semen to make the egg fecund, as the semen alone is not capable. Semen can be called the efficient cause of generation only to the extent that it is endowed with an ‘irradiant spirituous substance’ as it resides in the uterus. This is an obscure point, and one that his student, Harvey, criticized him for at length, but nevertheless Fabricius’ entire account of animal generation relies upon the work of this ‘spirit’. He explains, “My opinion is that when the semen of the cock is introduced and thrown into the first part of the uterus, it fertilizes the whole uterus, and also at the same time makes fertile all the yolks that fall into it, and finally the whole egg. This the semen effects by its peculiar faculty or its irradiant spirituous substance, just as we see other animals, also, rendered fertile by the testicles and semen.” Thus, Fabricius solves the problem of how the semen can fertilize an egg it cannot directly contact by invoking a ‘spirit’ which emanates from the semen. Generation occurs not through the physical intermingling of fluids, but rather by the mere proximity of semen to the eggs. The semen fertilizes the egg by a kind of radiant force or supernatural power of the semen’s spirituous substance. Fabricius invokes Aristotle to edify this point, “From this discussion, but especially too from what Aristotle writes, we gather, in the first place, that by its power the semen of the male gives a certain quality to the material and nutriment contained in the female; that the egg is vivified only by the force resident in the semen; and that Aristotle thinks that the eggs are fertilized by the semen of the cock, which expresses an extraordinary fecundative power.”

Of course, Fabricius realizes that we cannot merely put semen near any eggs to produce chickens. The semen must aided by a particular ‘place’ which also acts as an agent in the

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202 Ibid, 192
process: “for although the semen of the cock is the agent in the egg, so that the chick does not arise except through the power and faculty of the semen, experience nevertheless shows clearly that it alone is not sufficient, but that a place is of necessity required as an agent.” He marshals evidence for this by reviewing the writings by Pliny, Aristotle, Democritus, and Empedocles on all the places that conception has been reported to occur. He gathers that all these places share the common feature that they are hot. Accordingly, he specifies this second agent that facilitates generation along with semen as heat: “all these places produce young merely by virtue of their warmth and heat.” This heat however is a natural heat, not a supernatural heat arising from the spirit. Furthermore, heat is not a separate faculty from the spirit of the semen; the two work hand in hand, as the heat arouses the radiant spirit and spreads it throughout the hen’s uterus. But it is not the case that the heat can penetrate the egg shell any more than the semen can. It is spirit alone that in its radiance fertilizes the egg. Fabricius writes, “However, suppose this heat does have the power to transform the substance of the egg into a chick; even so, it does not affect the transformation of the egg in the egg as inherent in the place. What the varied heat of many different places does affect is merely to arouse the faculty of the semen still somnolent in its latent or potential state and summon it into activity …” This heat is distinct from semen, though essentially related to it insofar as the spirit of the semen is only aroused by a place’s warmth.

Descartes himself struggles with many of these same questions concerning the precise action of the semen, the production and relation of spirit, and the function of heat. His

\[203\text{ Ibid, 180}\]

\[204\text{ Ibid, 195}\]

\[205\text{ Ibid}\]
mechanical account of generation maintains much of Fabricius’ terminology and yet the function, order of production, and physical constitution of the spirit, the semen, the heat, and the egg are all radically reconceived. Descartes’ reconception of these elements crucial to generation is of course most influenced by his ultimate aim to account for generation without appealing to final causes, something that is always a background assumption in Fabricius’ Aristotellean approach. This assumption is even more pronounced in the work his student, William Harvey. Following Fabricius, Harvey believes that the egg is only fertile on account of some divine influence which enters the egg. He is not sure that it is a radiant spirit, but rather he calls it a goal-directed “internal formative agent”206. Leaving aside the details of how this formative agent functions, Harvey appeals to the formative agent’s ‘foresight’, which realizes the potentiality of the fetus and strives to become a particular kind of animal. He writes,

   Now seed and the conception of the egg are things of the same kind, and that which renders all these fertile is the same kind, and that which renders them fertile is the same in all of them, or something of a like nature and that is some divine thing, an analogue of the heavens, of art, of intelligence, and of foresight. This is plainly to be seen from its wonderous operations, it contrivance and wisdom in which there is nothing done to no purpose or rashly or by chance, but all things are established for the sake of some good or to some end.207

This ‘end’ is ultimately Nature’s self-preservation, as species reproduce in order to maintain the current order: “For since all generation was designed by Nature for the sake of perpetuity, [generation] happens more frequently among those creatures which are shorter lived and liable to


external injuries, in order that the species may not fail.”\footnote{Harvey, William. \textit{The Works of William Harvey, MD}. Translated by Robert Willis. The University of Pennsylvania Press: Philadelphia. 1989. p. 444} As James Lennox has pointed out, Harvey without question thinks generation on the order of final causes: “Because generation proceeds with ‘contrivance and wisdom’ such that everything is ‘established for the sake of some goal and to some end,’ the power transmitted in the act of fertilization must be an analogue of art, intelligence and foresight […] The cognitive act of the artist is the analogue of the act of generation.”\footnote{Lennox, James G. “The Comparative Study of Animal Development: William Harvey’s Aristotelianism.” \textit{The Problem of Animal Generation in Early Modern Philosophy}. Edited by Justin Smith. Cambridge University Press: New York. 2006. p. 42-3} This is roughly the copy/model approach that Descartes had invoked in his \textit{Traité}, though that is not a path Descartes seriously considered. In Harvey’s work, the formed animal precedes its generation, and hence the formative process must refer to a kind of ‘intelligence’ or supernatural spirit that can guide the generative process to its final end. Accordingly, the growth of the fetus is not blind and the spirit is not mundane; everything must take recourse to a kind of divinity or overseer that guides the process to completion.

The framework Fabricius and Harvey adopt from Aristotle is precisely what Descartes takes aim at in his critique of substantial forms: extended objects do not ‘know’ what they are doing. Just as a stone does not know the center of the earth so that it can fall in that direction, the semen and egg do not know what a human being is in order to develop into one. The process of growth is a blind process, without final causes, and accordingly, there is no need to take recourse to any kind of supernatural spirit or ‘foresight’ in the process of fertilization. In Descartes’ view, the spirits, the heat, the semen, and the egg are all to be accounted for in terms of his theory of the three primary elements introduced in his \textit{Principles}, as well as the motions unique to each.
That generation is to be explained in terms of efficient causes alone, without recourse to final causes, is evidenced first and foremost by the fact that Descartes’ most extensive writing on generation, the *Description*, is presented not as a separate chapter, but rather as an extended digression on nutrition. The mechanistic conception of generation accounts for the growth of the fetus just as we would account for any other kind of growth. The development of the fetus is just a particular instance of any other type of development like puberty, getting fat, or becoming thin – processes that are not directed toward any final state. As Stephen Gaukroger explains, “No one would see putting on weight as a process directed towards a state in which one is fat: this would be to get the causality the wrong way around.”

That is to say, it is not that one ‘is’ fat, and the body directs itself to that state by putting on weight; rather, putting on weight causes one to become fat. In this case, we would say that generation precedes being – the inverse of Harvey and Fabricius’ approach. Thus, in Descartes’ work we will see an account that does not qualitatively differentiate reproductive generation from any other kind of growth, although it is significantly more complex, and Descartes believes he can account for organic development of any kind in mechanistic terms. Accordingly the terms in play will be reconstrued in the mechanistic paradigm, most notably the heat essential to development and the semen.

To understand the everyday nourishment of the body, first consider that Descartes believes the entire body to be essentially a liquid, and accordingly even the bones and organs of the body are in continual flux: “One must consider that the parts of all bodies that have life and are maintained by food, which is to say animals and plants, are in continual change; in the way that there is no difference between them and what we call fluids, like blood, the humours, the spirits, and those we call solids, like bones, flesh, nerves, and the skin; if not that all particles of

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the latter move much more slowly than the others.”211 All these different parts of the body are nourished by the arterial blood as it circulates throughout the body. It accesses the ‘solid’ parts through small filaments or pores and in so doing both nourishes a particular solid part and releases the spirits and humours that reside in the blood. Descartes explains how eventually, “after numerous turns through these filaments in the body, they finally come to the surface of the skin […] through the pores of which these humours and spirits evaporate into the air.”212 This process of blood flow through the denser parts of the body results in the body’s growth, as the blood flows through the filaments and carries small particles with it toward the skin, causing the interior parts to move outward. In Descartes’ words, “in this way, the humours and spirits, by running along the small filaments that compose the solid parts, make these small filaments continually advance bit by bit.”213 This ‘bit by bit’ advancement is similar to the way a river pushes a delta out into the ocean, causing the land to ‘grow’. This is not goal-directed growth; it is merely the causal consequence of the movement of the blood through the body. In this way, nutrition and growth go hand in hand, as the blood nourishes the body with its content, but then in so doing, causes it to grow by its mere passage through the body’s outer regions. How the body, in middle-age, can be nourished and yet stop growing is a question Descartes never seems to consider. In any case, this process is what Descartes calls ‘nutrition’, and the development of the fetus is merely a particular case of this mechanical process.

In the Description, Descartes begins his treatment of fetal growth by declaring, “We can gain yet a more perfect knowledge of the way all the parts of the body are nourished, if we

211 AT XI 247
212 Ibid
213 AT XI 248
consider in what way they have first been produced by the seed.” In this statement, we must understand that Descartes intends to subvert and oppose the Aristotelian approach taken up by Fabricius and Harvey barely two decades before by putting generation on par with nutrition. The explanation for the development of the fetus, as a sub-set of everyday growth and nutrition lies not in some intrinsic principle, but rather in the mere motion of particles, a movement owed to an extrinsic cause which is none other than God Himself providing the force needed for motion. As we turn to the details of Descartes’ struggles with the question of animal generation, it is helpful to remember why he is working through the definition of terms such as ‘heat’ and ‘spirit’ or the order of the formation of organs. These struggles are a direct result of this larger project to eliminate teleological thinking from the study of nature. The elimination of teleological thinking forces a total reconception of the terms, and as we shall see defining these phenomena and the order of their appearance in the fetus is not easy to make sense of either for Descartes or for his followers.

Beginning with his fragments from 1630-32, which might perhaps have been meant to be part of his Traité de l’homme, we see that Descartes begins with the distinction between two types of generation: “One must consider that there are two kinds of generation, one without seed or womb, the other by seed.” Human beings of course fall into the latter category: notably, Descartes provides very little explanation for how reproduction might occur without a seed, although he is aware such organisms exist. Animals born in a womb require a seed. These animals begin their development when semen enters the vulva, where the seed ferments with the

\[\text{214 AT XI, 252}\]
\[\text{215 AT XI 505}\]
\[\text{216 AT XI 506}\]
help of the mother’s heat. This is very much in keeping with Fabricius’ model where the action of the semen is brought about by a natural heat, with the crucial exception that in Descartes’ thinking the heat initiates only a natural process of fermentation, while as we saw in Fabricius, the heat of the womb brings about the radiation of supernatural spirits.

Fermentation of the semen results in the formation of the brain, and this is the first organ present. Descartes maintains that even at this stage where the semen has fermented in the vulva to the point where a brain is present, “there is not yet an animal until the heart is produced.” In the early 1630’s Descartes seems to think that the brain must be present first, followed by at least the liver and the lungs. The heart actually comes fairly late in the process simply because of how Descartes thinks it is formed. But he maintains throughout the work that the animal is not ‘alive’ until it has a heartbeat. After enumerating all the organs formed before the heart, Descartes explains, “Yet all of this being done, there is still no animal until after the spirits have passed from the numerous parts of the brain into the lungs, the spirits are gathered and transported toward the liver through the arteria venosa” while the blood “is carried towards the lungs through the vena cava” and ultimately “the vena cava and the arteria venosa meet up and are joined by their fibers and fold back on themselves (quodammodo in se ipsas revolvuntur) producing the substance of the heart […] And here the animal begins to be because the flame of life is lit in its heart.” This account of animal generation is admittedly very obscure, but it is likely that Descartes would acknowledge that he was still trying to work out how a mechanical account of generation could be conceived. It is clear that he wants to account for the process in

\[ \text{AT XI, 507} \]
\[ \text{AT XI, 506} \]
\[ \text{AT XI, 509} \]
terms of the movement of particles, but he is clearly not happy with his explanation of how the spirits and blood are formed. Whereas in the later 1637 Discourse we learn that the heart is responsible for the heated blood and the production of spirit, at this earlier point in time, Descartes thinks that the blood and spirits combine to create the heart. That is to say, Descartes’ early work conceived the blood and spirits in an inverse relation to the heart, since the arteries grow into the heart, impelled by the blood and spirits, but he revises this idea in the Description, beginning with a clearer explanation of the semen, its constitution and its action.

Regarding the semen, the challenge for Descartes is, again, to describe the semen in terms of material particles alone, whose actions are accounted for by the laws of motion and physics, without any reference to divine spirits, Aristotelian souls, or Galenic faculties. Having recently studied Fabricius in the early 1630’s, Descartes was convinced that the male contributes the seed while the female supplies the heat of the womb. This heat allows the seed to ferment and the reproductive process begins. In the Description, he significantly deepens his account of the semen. Whereas in his earlier writing it was a simple liquid that fermented by the heat of the vulva, Descartes now believes that both the male and female contribute semen to the process. These two substances combine in the womb creating a mixture that is, “a confused mix of two liquers, which serve as a leaven for each other, heating each other in a way that one of their particles acquire the same agitation as fire, they dilate and press upon the others, and by this means they are arranged little by little in the way that is required to form the parts of the body.”220 This is a significant departure from Fabricius’ work in two ways. First the heat is not itself inherent to the place, but instead it is the mixture of male and female semen that makes the womb warm. Second, the male semen alone is not sufficient to fertilize the egg; both the male

220 AT XI 253
and female are active in the process of fertilization. On this latter point Descartes is not alone as we find similar claims in Fernel. For instance, explicitly contrary to Aristotle, Fernel writes, “Yet male semen does not achieve anything by itself and on its own, but only when mingled with female semen.”221 When Descartes writes that the particles “acquire the same agitation as fire” we know that he is talking about the motion of first element particles, the same motion present in the feu sans lumiere of the heart. Vincent Aucante summarizes this new conception of the nature of the semens and the production of heat, writing, “[Descartes] soon became convinced that the mixing of the two seeds was itself the origin of heat, bringing about as it did a kind of fermentation where each seed served as the ‘leaven’ for the other. Descartes thought that fermentation of the seed was a chemical phenomenon that could be compared with the famous feu sans lumiere located in the heart.”222

In conjunction with these new ideas on the nature of conception, Descartes had arrived at new ideas on the formation of the fetus as well. Whereas spirits had been produced before the formation of the heart, and had contributed to its formation, Descartes now believes that the heart is the first organ to be produced and the spirits proceed from its heat, as he explains in earlier sections of the Description. As Aucante explains, “the first organ formed is the heart, which in turn forms the blood and moves it through its own ‘fire’,”223 which is just to say that the heart moves the blood and produces the spirits through its heat just as he had described in the


Discourse in 1637. Perhaps it was the case that once Descartes had seen how the heart works and understood its status as the source of heat for the body, he reversed course on how the blood and spirits were generated in relation to the heart. This is not clear. In any case, it is clear that by the time he wrote the Passions in 1646 Descartes was certain the heart produced the blood and spirits through its own heat and not vice versa. Moreover, this heat itself was derived from the fermentation resulting from the mixture of the male and female semen.

As I have mentioned, Descartes is in union with Fernel, against Aristotle, that both male and female must contribute to the process, and both agree that the mixture of semen results in a kind of heat. For Descartes, like Fabricius, this heat is elemental or natural; for Descartes it is simply the movement of first element particles as we might find in the heart, fermented wine or wet hay. Fernel however is quite at odds with Descartes on this point. Fernel admits that the semen does in fact consist of primary elements, but this elemental constitution is really insignificant to its reproductive power. Anticipating what Fabricius and Harvey would write over 100 years later, the power of the semen derives “from a more divine and lofty starting point [principium].”

Continuing on, Fernel asserts, “Each man’s semen holds within itself the cause of his fertility, that is, the actual heat, which is hardly fiery at all; this kind does not emulate some faculty; but the spirit pent up in semen and the foaming body, and the nature in that spirit, match the element of the stars.” As Fernel would later state, “the semen is in no way fertile unless a great deal of vital spirit gathers out of the whole.” The reader will recall similar statements from Fernel on the nature of the heat of the heart. Recall Fernel posited the heat of the

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225 Ibid

226 Ibid 553
heart as the primary disposition that the rational soul joins itself to, and that this heat is composed of a kind of spirit that resides in matter, but is celestial and divine in origin. *This is the same spirit that resides in the semen as its essence*, giving the semen a similar Janus face between the mundane and divine: “This nature resides in the heavenly spirit, and that spirit is in the semen, by which it is conveyed to the whole created thing.” For Fernel, the nature of the vital heat of the heart as the site of vital spirit is, as we shall see, essentially related to the essence of the semen. However, in order to comprehend the significance of Fernel’s thinking on this point, we must first turn back to Descartes to understand how the heart is actually formed in the fetus according to his mechanistic philosophy.

The basic concepts that Descartes employs in the *Description* were all explained in his *Principles*; no new conceptual apparatus beyond the motion of particles are employed to grasp the phenomenon of organic generation. Descartes explains the action of the semen and the formation of the heart as follows:

> It suffices to say that [the particles of the seed] of plants, being hard and solid, can have its parts arranged and situated in a certain way […] but it is not the same with the particles of animal semen, which is completely fluid, and ordinarily produced by the conjunction of the two sexes, seem only to be a confused mix of two liquids which serve as a levain for each other, heating each other in such way that some of their particles acquire the same agitation as fire, dilate and press upon the others, and in this way arrange [disposent] the particles little by little in the way required to form the organs.

This is not easy to understand, but we are helped by the fact that we have seen Descartes’ interest in heat that is produced by liquids in our investigation of the heat produced in a fully formed heart. Here, the heat produced by the mixture of semen ferments and creates a similar kind of heat, which results in the formation of the heart. Descartes writes, “I believe that the first thing to

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227 Ibid

228 AT XI, 253
appear in the mixture of semen, and which makes all of its droplets stop from being the same, is that the heat is excited here, and acts in the same way as in new wines when they boil, or in hay when it has been shut away before dry, and here it dilates, they press the others that surround them and begin to form the heart.”229 Once these particles press on each other enough to form a solid substance, their continued dilation forces some particles to expand outward. Following the principle of rectilinear inertia, these particles begin to move in a straight line, but they do not travel far until they encounter resistance and then they must turn backward and are pushed back the way they came. This point of resistance is nothing other than the walls of the heart. As the heat pushes particles outward to the wall, and then the particles are displaced and circulate back toward the heat, a circle of movement is formed. As the particles continue in this circular movement, each time they “expand and move away, following the same path as the former” and in so doing with each circulation the particles move out from the heat a little father until bit by bit the walls of the heart are pushed out and all of its cavities are formed, followed by the formation of the lungs, and then the brain. In this sense, it is a process of growth like nutrition whereby particles of matter are carried farther away by a steady flow of liquid, be it blood or first element particles. The heartbeat itself is nothing other than this process of dilation and expansion, continuously propelled by the heat in the heart. As Descartes writes, “And it is this expansion, which occurs thus in a repeated way, that the beating of the heart, or the pulse, consists.”230 Thus, the male and female semen combines to create heat, heat creates the heart, the heart is the first organ formed, and is the source of heat for the animal, be it a fetus, an infant or an adult, continues to be the heart throughout its life. The heart emerges from this heat and the

229 AT XI, 254

230 AT XI 254
heat in turn takes up its residence in the heart. This heat, the principle of life, is always of the same nature be it in generation or the heartbeat, and Descartes even invokes the same metaphors to explain the heat that propels generation as well as that which resides in the fully formed heart.

Descartes is at once very close and very distant from what Fernel had written on these issues 100 years earlier. Fernel does not believe that the heart is exclusively the first organ formed, deciding instead that it must be the liver, brain and heart together. Nevertheless, like Descartes, it is not by accident that Fernel believes the heart is the site of vital heat, maintaining the life of the body. His position begins with the assertion that spirit is responsible for all of generation: “[T]his spirit, the regulator of heat and all the faculties and the originator of procreation, gathers into the center of the semen. It does not vanish, or fly off from the semen, although many people take Aristotle this way, but continues in it as the craftsman fashioning all the parts, is utterly and fundamentally imbedded in them, and becomes their original nature.”

Yet, even though the spirit and the vital heat it carries are embedded in the whole body, it is most concentrated in the heart. This is due to the fact that the semen is not uniform, but rather the spirit is concentrated in the ‘center’; each organ that develops out of the semen takes on the particular character of that part which it develops out of. As Fernel explains, “First of all, swelling with much spirit, [the semen] spreads itself out, and pervading everything it separates off the different parts in the semen (which looks simple and uniform, yet is not so), the hot from the cold, the thin from the thick and earthy, so that individual parts end up adopting their own nature, and are assembled for the fashioning of the parts from which in the past they withdrew.”

Unsurprisingly, the heart develops out of the hottest, most spirituous, and most

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232 Ibid 579
divine bit of semen, allowing it to take on that character. This concentration of spirit and heat remains with the heart throughout its life, and as with Descartes the heart serves as its residence. As we know, in Fernel’s work this is the primary disposition at play in attracting the rational soul to come down from the heavens and join with the human body. The possibility of this union is derived not from the nature of the heart, but the semen that forms the heart out of its dense accumulation of divine spirit. Hence, the primary accommodation for the reception of the rational soul is founded upon this specific account of the semen.

This fact is not lost on Descartes, as he adopts a very similar position. And yet the mechanistic approach does not permit the actions of divine spirit. In its place, the formation of the heart and its resident heat are composed strictly of the motions of first element particles. Beyond the circular motion we mentioned in Chapter 1, these particles are in no way ‘celestial’. For Descartes the semen is material, and so is its heat which drives the process of generation. Accordingly, the heat of the heart is no more and no less material, as it is the first product of the movement of the semen’s particles. We find Descartes emphasizing this position in the Description, such as when he claims, “And I do not know of any fire or heat in the heart than this agitation of the particles of the blood…” or “this movement of the diastole has been caused from the beginning by heat, or by the action of fire, which, following what I explained in my Principes, is not able to consist of anything other than the first Element.”233 This strictly mundane process must be contrasted with what we see in Fernel, or even Fabricius. In both thinkers, though most explicitly in Fernel, the process of generation simply cannot be accomplished without the aid of some extra-mundane element. Fernel understands that the semen itself must bridge the gap between this world of elemental particles and the other world from

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233 AT XI 281
which the rational soul originates. Although it is true that the heart’s heat is the disposition that accommodates the soul, as we saw in Chapter 2, this heat and its dual nature are owed to a concentration of spirit in the semen from which the heart develops.

In contrast, Descartes reduces the heat to a byproduct of matter and motion, and thus the heat produced through the mixture of male and female semen is not divine or spirituous at all. It just is the same heat found in other inorganic processes such as the fermentation of wine or the warmth of wet hay. Nevertheless, Descartes believes that this is the heat that sparks animal generation, setting the particles in motion that soon begin to form the heart. As we have seen, this heat, created through the mixture of male and female semen, forms the heart and continues to reside there throughout the life of the organism. And just as the divine spirits produce a supernatural kind of heat to accommodate the rational soul in Fernel, Descartes tries to replace this apparatus with a mechanical theory of generation and vital heat. As we shall see after our investigation into the question of love, this becomes the crux of the problem.

**The Generation of the Soul**

As was the case with Suarez, Descartes denies that the soul is educed from matter, stating that it must instead be created directly by God, *ex nihilo*. In so claiming, he also follows Fernel in stating that the parents only contribute dispositions, or a certain arrangement of body parts, which the soul then enters from on high. However, as is the case with almost everything he engages, Descartes provides some important reinterpretations of these traditional Scholastic doctrines that make his thoughts on the matter both innovative but also difficult to grasp. Fortunately, Descartes’ writings on the nature of the soul and its creation are some of the most
well-known and well-read excerpts of his entire corpus, removing us temporarily from his more obscure, though more extensive, work in physiology. In this section we will focus mainly on the Second and Third Meditations from 1641 as well as his Replies, wherein Descartes attempts his famous proof of the general thesis of the Meditations that the soul and God are the most certain of all things and thus serve as an unshakeable foundation for the sciences.

As we know, Descartes demonstrates in his First Meditation that we cannot have reliable knowledge of the physical world if we do not first know the nature of the soul and the nature of God, while in the Second and Third Meditations he demonstrates that we can have knowledge of God and the soul without any knowledge of bodies whatsoever. Because our concern is with the generation of the soul, we must focus on the Third Meditation, and there the second proof of God in particular, where God is shown to be the creator of my whole existence. Once this proof is clear, we must then ask how Descartes thought that God was able to create the soul, and what the nature of such a God must be. This question leads back to Suarez who delivers a similar proof of God in his 29th and 30th Disputations. But before we begin looking at the debates surrounding the creation of the soul, let us first be absolutely clear on what exactly the soul is in Descartes’ work.

As Descartes makes clear in the Second Reply, the aim of the Second Meditation is to isolate the soul from the body. This puts Descartes at odds with Aristotle, or any Scholastic thinker, who believed that the soul had not only a rational form but was also a principle of matter by which the body grew and was nourished. As we have seen, in his Traité de l’homme or Description, Descartes is firmly at odds with this position, and he went to great lengths to demonstrate that the body can function, regenerate, and grow without a soul, simply through the arrangement of its parts. Casting all of the Aristotelian tradition somewhat pejoratively as

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234 AT VII 131
‘primitive’ in his reply to Gassendi, Descartes distinguishes his use of the word ‘soul’ quite clearly when he writes,

Thus, primitive man probably did not distinguish between, on the one hand, the principle by which we are nourished and grow and accomplish without any thought all the other operations which we have in common with the brutes, and, on the other hand, the principle in virtue of which we think. He therefore used the single term ‘soul’ to apply to both; and when he subsequently noticed that thought was distinct from nutrition, he called the element which thinks ‘mind’, and believed it to be the principle part of the soul. I by contrast, realizing that the principle by which we are nourished is wholly different – different in kind – from that in virtue of which we think, have said that the term ‘soul’ when it is used to refer to both these principles, is ambiguous. If we are to take ‘soul’ in its special sense, as meaning the ‘first actuality’ or ‘principal form of man’, then the term must be understood to apply only to the principle in virtue of which we think; and to avoid this ambiguity I have as far as possible used the term ‘mind’ for this.235

In the *Meditations*, the ‘I’ is a thing that thinks, which is to say a mind or an understanding, or reason. Sometimes we see the word *mens* translated as *esprit* and other times as *âme*, but this should not cause us any problems. In either case, it is not a corporeal entity, it is entirely distinct from the body, a pure intelligence.236 As Descartes explains in the above cited passage, he takes pain to rigorously distinguish between ‘mind’ and Aristotelean ‘soul’: “That substance in which thought immediately resides is called ‘mind’. However I am speaking here of mind rather than of soul, since the word ‘soul’ is equivocal and is often used for something corporeal.”237 But because he has discussed the point at such great lengths not only in the *Meditations* but also in his writings on physiology, it would be careless to think that by *animaus* or *âme* Descartes intends a corporeal thing. This is why we find exceptions to the rule, such as when Descartes writes in

235 AT VII 356


237 AT VII, 161
the Latin *Meditations*, “*Mens, sive animus, sive ratio, sive intellectus*”\(^{238}\) or when Descartes explains to Silhon, “The soul [*l’âme*] is a being or a substance that is not at all corporeal, and whose nature is only to think, and also it is the first thing we can know certainly.”\(^{239}\)

When the Second Meditation asks us, “Who am I, I who exists?”\(^{240}\) whether he uses the word mind, or soul, or reason, or intellect, Descartes knows that he is a thinking thing, exclusive of anything corporeal. He is a mind whose nature is essentially thought or intelligence, exclusive of senses or corporeal imagination. As Gueroult explains, “In this way, the true meaning of the word *mens, animus, intellectus, ratio*, which were until then unknown to me, become known to me. I now know that these different terms must be equated, since they all designate one and the same principle, intelligence, which by itself constitutes the one and only condition of the possibility of my knowledge in general.”\(^{241}\) If this was not clear from the Second Meditation alone, Descartes makes it so in his *Replies* and correspondence. The question now becomes how is the soul created, and whether it can be demonstrated with certainty that creation occurs *ex nihilo* by God. This is the task of the Third Meditation.

As Descartes enters the third day of his experiment, he has established the certainty of the *cogito* as his ‘Archimedean point’. However, the *cogito* by itself has no bearing on the hypothesis of the evil genius, and thus the certainty of our clear and distinct ideas remains in question. Thus, the passage from the certainty of my existence to the certainty of the existence of objects that exist outside of me demands the proof of God provided by the Third Meditation.

\(^{238}\) AT VII, 27

\(^{239}\) AT I 353

\(^{240}\) AT XI, 21

This section of course features two proofs: one regards the genesis of my idea of God, and the other concerns the genesis of the thinking substance in general. The first proof is well known, but let us summarize it in any case:

I think, therefore I am, and as I state this I am none other than a thinking thing. In order to attain knowledge of God, I need not look outside of myself, but rather deep within myself amongst my ideas. Throughout my many ideas, one stands out as the idea of the infinite or perfect, which is none other than the idea of God Himself. It stands as an accepted axiom that everything has a cause, and every cause has at least as much perfection as its effects. That is to say, each idea has two aspects: its formal reality and its objective reality. The formal reality of an idea is simply its existence as a modification of the thinking substance, and from this point of view all ideas are equivalent. In contrast, when we think of ideas in terms of their objective reality, we are thinking of them as representational. It is the objective reality of an idea that is precisely proportional to the reality of the thing represented. Accordingly, the cause of my idea of the infinite and perfect must itself be just as infinite and perfect. Therefore, God exists.

This proof however, only proves God as the efficient cause of the idea of the perfect in us, but as Gueroult points out, “the second [proof] posits God absolutely in himself, considering his causality not only relative to ourselves, but also relative to himself, meaning as his own cause. Correlatively, God is no longer simply posited as cause of an idea in us, but as cause of us, who have this idea. Thus, God is certified as Creator of my substance.”242 Of course, the second proof cannot be entirely abstracted from the first, as it serves to amplify and emphasize certain aspects of the first proof. Yet because this second proof concerns not only the proof of a

242 Ibid 175
single idea, but also the origins of the complete substance, our investigation into the generation of the complete soul-body union finds this second proof more relevant.

The idea that the soul is created by God is clearly an idea with strong ties to the Christian tradition. Nevertheless not all Christians affirm the idea that the soul originates with God outright. Augustine for instance, in *De libero arbitrio*, states that the problem cannot be resolved: “of the four opinions about the soul, whether it comes to be from the seed, or whether new souls come to be in each of those who are born, or whether souls that already exist somewhere are either divinely sent, or fall of their own will, into the bodies of those who are born – none should be rashly affirmed.” Moreover, Lutherans thought that every soul but Adam and Eve’s were produced directly by the parents. This position is tied to the question of whether or not the condition of ignorance we are born into is tied to some previous sin. How could we be born into such difficulty and ignorance if God does not cause sin? It must be the case that the original sin inheres in the soul and the soul is passed on by the parents to the child. This explanation is designed to preserve God’s perfection, since if God had created the infant’s soul, he would have infected it with sin, an action at odds with His perfection and benevolence.

Yet, as is the case with so many themes in Descartes, Suarez best illuminates Descartes’ own thinking. Suarez’s metaphysical proof of the existence of God in Disputation 19 puts the question of the generation of the soul at the heart of the matter. His examination begins with the possibility of a proof of God beginning with the Aristotelian precept: “Everything that is moved is moved by another.” As Suarez notes, we could prove that there must be a ‘prime mover’ by following the regression of causes back to a first cause. Yet this approach, motivated by Aristotle’s *Metaphysics* 12.7.1072a24-27, does not make clear whether the mover *is or is not*. It

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243 III xxi p.59
could be that the prime mover is not, and thus the first motion is caused by a miracle. Of course, we suppose that this is not the case, but this assumption at the base of the proof of God does not satisfy Suarez. As a remedy, he introduces a similar, though crucially different principle: “Everything which is made is made by another.” This assumption is justified by the following deduction: “This principle is demonstrated from this – that nothing can effect itself. For a thing which comes to be by being effected acquires being; but a thing which makes or produces [anything], is supposed to have being. Therefore it is clearly repugnant that one same thing make itself; for before a thing is, it cannot be in either formal or virtual act to make itself.”

This substitution of movement for production makes the proof of God essentially a question regarding the cause of creation, and this is precisely the aim of Descartes’ second proof of God: to demonstrate God as creator.

The second proof of God in the Third Meditation begins, “And I ask, from whom do I derive my existence? Perhaps from myself or from my parents, or from some source less perfect than God; for we can imagine nothing more perfect than God, or even as perfect as He is.” The chief burden in the proof is to demonstrate that Descartes needs a cause other than himself; once he has accomplished this the same reasons that make my own self-creation impossible will also deny the possibly that my cause can be anything inferior to God. Could I have created myself ex nihilo? No, since if I had the power to create myself ex nihilo, then I would have the power to do easier things such as acquire all sorts of knowledge I do not have or to accomplish any of the other things contained in my conception of God. That is to say, if I could have created my substance, then certainly I could have created my accidents. At the basis of this assertion lies

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245 AT VII, 48
Descartes’ assumption that all creation *ex nihilo* requires omnipotence, and since I could not accomplish the lesser task of attributing accidents to myself, I could not be omnipotent. Therefore, I am not the creator of my own mind.

Because I am not my own author, I must then depend upon some other being. That is, I must depend upon some other being *at all times*, since I am neither able to create myself nor sustain myself. This is derived from the nature of time as Descartes conceives it: “For all the course of my life may be divided into an infinite number of parts, none of which is in any way dependent on the other; and thus from the fact that I was in existence a short time ago it does not follow that I must be in existence now, unless some cause at this instant, produces me anew, that is to say, conserves me.”

This statement makes clear the fact that, “There is only a distinction of reason between preservation and creation. The present time does not depend on the preceding time. That is why, in order that a substance be preserved for all the moments it lasts, it needs the same necessary action to create it anew, as if it were still not in existence.” The power to create myself and the power to preserve myself are, for Descartes, one and the same power, an assertion that rests on the assumption that time is discontinuous and that no instant of a thing’s existence depends upon the preceding instant. My continued existence depends upon my being created anew at each instant, as if it were the first creation of my mind.

The cause of my conservation in this case again cannot be myself, since an interrogation of my mind reveals that I possess no such power capable of conserving myself through time, and “if such a power did reside in me, I should certainly be conscious of it.” Finally, since I do not

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246 AT VII 49


248 Ibid
have the power to preserve myself nor the power to create myself, powers which are identical, I
must not then be a *causa sui* in either sense.

This conception of time is essential to the proof because Descartes aims to avoid a
discussion of the role of the parents in the creation of the soul. If he permitted the soul to be
taken by the parents, he would then have to inquire into the origins of their soul, and thus
enter an infinite regress. He writes, “This approach is clearly different from seeing that I was
taken by my father and concluding from this that he was in turn taken by my grandfather
and from putting an end to my search by declaring that some cause is first, because in seeking
the parents of parents I could go on to infinity.” An infinite series of causes cannot however be
grasped by a finite mind, and hence the focus of the proof on the cause that preserves or creates
me presently.

This question of the infinite regress is not unique to Descartes’ proof of God. Once again,
turning to Suarez, we find similar issues with a different solution. Suarez’s proof of an uncreated
being is as follows:

Every being is either made or not made, that is, uncreated. But all beings in the totality
[of being] cannot be made. Therefore, it is necessary that there be some being which is
not made, or which is uncreated. The major [premise] is evident, because: of the two
contradictories one must be found in something or other. The minor [premise] is proven:
because every being which is made is made by another. Therefore, either that other by
which it is made is itself made or not. If it is not made, then there is given some uncreated
being, which is what we are looking for.”

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249 AT VII 107; See also Gueroult, Martial. Descartes’ Philosophy Interpreted According to the Order of Reasons. 2
volumes. Translated by Roger Ariew. University of Minnesota Press: Minneapolis, MN. 1985. p. 176; Gilson,
208

Suarez realizes that we may not ever actually reach an uncreated being, and our search may go on forever. This would make his proof of God untenable, and to avert this objection, he claims that the very idea of a species or a series includes the idea of an independent cause. The series as a whole must have been caused, and this cause simply cannot be in the series. If this were not the case, then the entire species is causa sui, ex nihilo, a status reserved for God. As Suarez explains, “For it is impossible that the whole collection of beings or of efficient causes be dependent in its being and in its operation. Therefore, it is necessary that among them there is something independent. Therefore, we cannot go on in that progression to infinity, but we must stop at an unproduced being which is also independent in its causing.”

Descartes avoids this solution, and the whole issue of the succession of causes, by asserting several times that we are inquiring into the creation of the soul not only at birth, but also throughout each instant, and these are not qualitatively different forms of creation.

This brings us to Descartes’ proof of God as the creator of my soul. I cannot be caused by myself, but my external cause cannot be referred to my ancestral heredity. To show that this external cause is God, Descartes invokes the axiom that there must be at least as much reality in the cause as there is in the effect. As a thinking thing with a certain idea of God, “it must be granted that what caused me is also a thinking thing and it too has an idea of all the perfections which I attribute to God.”

This entity is God Himself, upon whom my whole existence depends. Because the cause must resemble the effect, not only did God create me, He made me in his image. However, that is not to say that I am infinite and perfect. I resemble God in a

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251 Ibid 70

252 AT VII 49
comparative sense, which is to say, of all of God’s creations, as a thinking thing I come closer to God’s nature than any other entity.

God’s creation of the mind *ex nihilo*, is a qualitatively distinct kind of creation from the creation of the fetus that we looked at in the last section. The parents’ creation of the body is in fact the production of something outside of themselves that did not yet exist, but this creation is just an ordering of a preexisting chaos of particles. The parents do not *create* that chaos however: it is merely the transformation of the male and female semen, and the epigenesis occurs through the preexisting elements that are in place. Nor do the parents maintain the body they have given birth to. In Descartes words, God is both the cause of coming-into-being and being, while the parents are only the cause of coming-into-being, and even then, this causation is just the rearrangement of pre-existing particles. He writes, “[A]n architect is the cause of a house and a father a child only in the sense of being the causes of their coming-into-being; and hence, once the work is completed it can remain in existence quite apart from the ‘cause’ in this sense. But the sun is the cause of created things, not just in the sense that they are causes of the *coming* into being of these things, but also in the sense that they are causes of their *being*; and hence they must always continue to act on the effect in the same way in order to keep it in existence.”

This point is illustrated most clearly by the way in which Descartes avoids the problem of an infinite regress by insisting that my existence is a continual creation, and insofar as the instants of time can be infinitely divided, the duration of my mind is in fact an infinite series of creations. Because of this I am dependent upon a cause for my being through time, just as the rays of light continuously emanate from the sun. In this sense God preserves me.

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253 AT VIII 369
With this established, Descartes’ claim near the end of the Meditation that the parents do not create the mind is a formality. He writes, “Finally, so far as my parents [from whom it appears I have sprung] are concerned, although all that I have ever been able to believe of them were true, that does not make it follow that it is they who conserve me, nor are they even the authors of my being in any sense, insofar as I am a thinking being; since what they did was merely to implant certain dispositions in that matter in which the self –i.e., the mind, which alone I at present identify with myself – is by me deemed to exist.” After considering Suarez and Fernel, this tradition of thinking should be amply clear, but in Descartes the point almost does not need to be made. All of his physiological writings are dedicated to demonstrating the claim that the body does not need the soul to operate, and again in the *Meditations*, he establishes with certainty the complete heterogeneity of body and soul. The parents who contribute the body contribute the dispositions or arrangement of its parts that the soul then inters into. The laws and causes that govern the creation of these dispositions, and the formation of the fetus, are not related to the cause of the thinking substance. They are, in a word, not just two substances, but two utterly distinct genealogies.

As a result of this, we must note that in certain sense like does not beget like for Descartes. That is, the parents do not give birth to a human being, if by ‘human being’ we understand a union of mind and body. Human beings do not generate human beings through coitus; rather they generate animals, or *machines animales*. Thus, biologically speaking, Descartes breaks with Aristotle’s assertion that like begets like. However, theologically, Descartes makes clear that like begets like, meaning that God creates the soul in his image, evidenced by the fact that the soul bears this innate idea of the infinite and perfect. “To be sure, it

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254 AT VII 50-51
is not astonishing that in creating me, God should have endowed me with this idea, so that it would be like the mark of the craftsman impressed upon his work, although this mark need not be something distinct from the work itself. But the mere fact that God created me makes it highly plausible that I have somehow been made in his image and likeness, and I perceive this likeness, in which the idea of God is contained, by means of the same faculty by which I perceive myself.\textsuperscript{255} To be sure, the parents do contribute something important to the human being in the form of the body’s dispositions, namely the blood and the heat of the heart. But this is not the human essence. The Cogito, authored by God in His image is the essence of my substance, and this substance, derived directly from God, is immune to the influences of mundane, sexual heredity. It may be true that the body can inherit certain aspects from the parents, but the mind is common to all humans.

God’s authorship of the soul does establish the difference between humans and animals, but it does not establish any difference between humans. This is made evident when Descartes states that reason is “complete in each person.”\textsuperscript{256} He restates the homogeneous nature of the intellect in the \textit{Discourse}, where he writes, “the power of forming a good judgment and of distinguishing the true from the false, which is properly speaking what is called Good sense or Reason, is by nature equal in all men. Hence too it will show that the diversity of our opinions does not proceed from some men being more rational than others, but solely from the fact that our thoughts pass through diverse channels and the same objects are not considered by all.”\textsuperscript{257} This is a direct consequence of God’s generation of the mind, a point not lost on other modern

\begin{footnotesize}
\textsuperscript{255} AT VII 51  \\
\textsuperscript{257} AT VI 2
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thinkers who investigate human diversity through the Cartesian paradigm. For instance, Francois Poullain de la Barre\textsuperscript{258} criticized 17\textsuperscript{th} century sexism on the basis of the uniformity of the Cogito across gender boundaries. He was able to argue the equality of the sexes on the basis of the two separate lineages of mind and body:

It is easy to see that the difference between the two sexes is limited to the body, since that is the only part used in the reproduction of humankind. Since the mind merely gives its consent, and does so in exactly the same way in everyone, we can conclude that it has no sex […] A woman’s mind is joined to her body, like a man’s, by God himself, and according to the same laws. Feelings, passions, and the will maintain this union, and since the mind functions no differently in one sex than in the other, it is capable of the same thing in both.\textsuperscript{259}

This is a point we shall return to at the conclusion of the essay; for Descartes, the mind’s divine ancestry makes body types irrelevant as an indicator of mental capacities. This point was noted not just by feminists, but also anthropologists, physionomists, and philosophers.

How exactly is the soul created by God? We know that the soul, which cannot cause itself and cannot be derived from the parents, must be caused by an omnipotent being that has the power not only to create itself, and does not derive its own existence from another. Thus, if there ever were a question of an infinite regress, that problem is resolved through God’s own existence as not only my cause but also His own cause: “But I do readily admit that there could be something in which there is such a great and inexhaustible power that it never needs the help of anything in order to exist. Nor again does it now need a cause in order to be conserved. Thus in a manner of speaking, it is the cause of itself. And I understand God to be such a cause.”\textsuperscript{260}

\textsuperscript{258}\hspace{1em} For more on De la Barre’s application of Descartes’ philosophy see Schiebinger, Londa. \textit{The Mind Has No Sex?} Harvard University Press: Cambridge, MA. 1989. p. 170-178.

\textsuperscript{259}\hspace{1em} Poullain de la Barre, Francois. \textit{Three Cartesian Feminist Treatises}. Translated by Vivien Bosley. The University of Chicago Press: Chicago. 2002. p. 82

\textsuperscript{260}\hspace{1em} AT VIII 109
proof of God’s existence and the assertion that God is the author of my soul, must terminate in this assertion that God is \textit{causa sui}. Otherwise, we are lost in an infinite regress of ancestors, or if we look at the preservation of my existence at this instant, we are left to conclude that I am the own author of my existence. In order to deny these possibilities, Descartes must reach a self-caused cause with every divine perfection.

However, Descartes recognizes the unorthodoxy of his claim that God is self-caused. He is warned against claiming that God is caused at all in the \textit{First Objection}, to which he responds, “I am aware that theologians of the Latin Church do not use the word \textit{causa} in speaking of divine matters.”\textsuperscript{261} Descartes is certainly careful in his discussion of God as ‘caused’. He does not use the term or explicitly discuss the issue in the \textit{Meditations}, the \textit{Discourse}, or the \textit{Principles}, choosing to reserve the discussion for the \textit{First} and \textit{Fourth Replies} alone. Marion believes that Descartes inaugurates the idea of the God’s causation, as the concept of God as \textit{causa sui} is denied by Aristotle, Aquinas, Anselm, Duns Scotus, Ockham, and Suarez.\textsuperscript{262} Marion’s scholarship on this matter once again leads us back to Suarez, who states that “God is without principle and without cause,”\textsuperscript{263} and “For God does not have a cause of His being, through which he might be demonstrated a priori.”\textsuperscript{264} Against this backdrop, Descartes insists, “It is because of the common scholastic axiom ‘nothing can be its own cause’ that ‘from itself’ has not been taken

\textsuperscript{261} AT VIII 237


\textsuperscript{263} Ibid p. 143

Let us see how Descartes understands the ‘from itself’ and thereby makes his a priori demonstration of God in the Third Meditation a legitimate proof.

When Descartes says that the soul is created \textit{ex nihilo}, it clearly does not mean that the soul has no cause. Nor does it mean that the soul is created out of ‘nothing’ if we take nothing to designate a kind of privation or lack. The soul, being created by God is created \textit{ex nihilo} not in the sense that it is created out of something so insignificant it is ‘nothing’, but rather it emerges out of something so immense and so powerful that it cannot be represented by the mind. Insofar as the mind is finite, and thus can only represent limited, or measurable entities to itself, it may in fact seem the case that God is nothing. But this is a kind of nothing that is very different from the nothing that can measured, such as when we measure September’s rainfall and conclude that there was ‘no rain’, or when we drill for oil in the ground and find ‘nothing’. These latter cases are reduced to a measurement, and as such it is represented, or fully understood by the mind. The soul is created ‘out of nothing’ and God is ‘without cause’ in a wholly different sense. Descartes explains the cause of God as follows: “But if we have previously asked why God exists or why he continues to exist, and, on noting the immense and incomprehensible power which is contained in the idea of God, we acknowledged that this power is so overwhelming that it is clearly the cause of God’s continuing to exist and that nothing but this can continue to be the cause, then we are saying that God is derived from himself – this no longer in a negative sense but in a thoroughly positive sense.”\footnote{AT VII 110} That is to say, we cannot understand \textit{causa sui} or \textit{ex nihilo} in a negative sense: to say that God is the cause of himself is simply to point to his essence, which is infinite power, knowledge, and goodness. As such, his essence causes him to exist as

such, and this essence is entirely positive, without any privation, and thus, it cannot be said that ‘derived from himself’ designates a lack of cause. This ‘without’, this ‘from itself’ and this ‘ex nihilo’ all refer to God’s essence, which is simply the most positive thing our minds can touch. As Descartes insists, “Here I had in mind merely that God does not need an efficient cause in order to exist is founded on something, namely the very immensity of God, than which there can be nothing more positive.”267 The reason God needs no cause is because his essence is an “inexhaustible power,”268 “And since this inexhaustible power or immensity of essence is incomparably positive, I said that the cause or reason why God does need a cause is a positive one.”269

This ultimately means that God is the cause of himself in a sense different from that which makes him the cause of created things in the world. In the case of the latter, God is an efficient cause. In regard to Himself, it is God’s essence to exist without dependence on another being simply because his essence, being this immensity of power, does not the help of another to be created or preserved. God is thereby not his own efficient cause, but rather his own formal cause: “For those who follow exclusively the lead of the light of nature immediately at this juncture form a certain concept common to both efficient and formal cause alike, i.e., what is derived from something else is derived from it as it were from an efficient cause; but whatever is derived from itself is derived, as it were, from a formal cause, that is, because it has an essence of such a type that it does not need an efficient cause.”270 And it is this positive essence that

267 AT VII 231
268 AT VII 236
269 Ibid
270 AT VII 238
Descartes is pointing to when he states that the soul is created *ex nihilo*. Because this infinite power is not my own essence, I could not have created myself out of nothing, and thus I must ultimately be derived from ‘nothing’ in the sense of God’s “incomparably positive” essence.

Turning our attention back to the soul-body union, let us recall what Suarez had said on these matters. Recall that Suarez argued that the soul, not educed from matter, is a ‘true creation’, meaning that the soul is created *ex nihilo* by God. He states,

> It is a true and peripatetic view that among substantial forms some are spiritual, substantial, and independent of matter, though they truly inform matter, while other forms are material and so inherent in matter that they depend on it in their being and their coming to be. Only human souls are of the first group, for we are dealing solely with informing forms, and concerning these one must concede the inferred conclusion in the difficulty touched on, namely, that they come to be out of nothing by true creation.  

This ‘out of nothing’ is ‘out of God’, since natural being do not have the power to accomplish such a miracle: “Hence one ought to concede concerning this form that proximate natural agents do not have the power to produce it, but that the proximate agent disposes the matter, while a separate intelligence produces the form, not of course, a created intelligence, as Avicenna thought, nor an idea that is separate and existing outside of God, but God Himself…”

However, in spite of the fact that God has this supernatural power of creation, his power is not infinite.

God’s power is finite at least as it pertains to the way He creates the soul. Because the soul is an act proportioned to appropriately disposed matter, in order for the human being to be a true union, the active and passive parts must correspond. As we have seen, the body cannot just

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271 AT VII 236


273 Ibid 52
be any body, but it must be a body with the appropriate dispositions, the most important being, as physicians at the time thought, the heat of the heart. Yet there are not only constraints on how the body is created; there are constraints on the soul as well, and according to Suarez, God is constrained to make the soul proportionate to the body. In this sense, Suarez concedes that God’s supernatural power to create is subservient to and constrained by the natural order: “[A]lthough this form can be made only by God, in this action, nevertheless, God acts according to the manner and order owed to natural things, and this suffices so that He may be said to operate in the manner of a natural cause and so that a sufficient active potency may correspond to the passive potency.”274

It seems that insofar as Descartes admits the human being as a substantial form, this same rationale should apply to Descartes as well. Isn’t God confined to creating a soul that will correspond to the body? Does this not contradict God’s immense power, His pure positivity, and thereby call his status as both causa sui and Creator ex nihilo into question? Can God create a soul proportioned to a human body? Or still, can he create a human being without creating a soul proportioned to the human body, and thus be unrestricted by the natural order in his creation of the soul? Descartes states over and again that God is completely free, even in the creation of the eternal truths. As he writes to Mesland in 1644, God could have made “it untrue that the three angles of a triangle were equal to two right angles, or in general that contradictories could not be true together.” Further on he writes, “the power of God cannot have any limits.”275 How could an omnipotent God be limited by nature in his creation of the soul? Is Descartes forced to make the same concession Suarez made on this point?

274 Ibid 53

275 AT IV 110
The resolution of the problem depends on the differing meanings of the word ‘nature’ in Suarez and Descartes. As we know, for Suarez, nature is the realm of substantial forms, and each natural being has the principle of its behavior and the cause of its actions immanent in it. As we learned in the First Chapter, Descartes denies the existence of substantial forms, but in so doing, he locates the principle of force causing the movements and changes in nature in God alone. We thus had said that while in Suarez the principles of change are immanent and specific to each thing, in Descartes this principle is located in a transcendent, omnipotent God. Accordingly, when Suarez writes that God’s creation of the soul is limited by the natural order, he means that the soul must be proportioned to nature in the sense that ‘nature’ is a realm distinct from God. God must create the soul this way in order that it may enter the body, and he cannot create a soul that may enter any other body in nature, such as one which has educed its own form. The meaning of ‘nature’ in Descartes’ work is crucially different. As Descartes states in the Sixth Meditation, “And surely there is no doubt that all that I am taught by nature has some truth to it; for by ‘nature’, taken generally, I understand nothing other than God himself or the ordered network of created things which was instituted by God.” It is this general sense of nature to which Suarez is referring; it poses a problem for God’s omnipotence, especially concerning the creation of the soul. Nature in the general sense refers to physical nature, in this passage my senses in particular. This nature simply is God in the sense that God creates its motion and currently maintains its motion, through the medium of force. This is a point we have discussed in Chapter 1.

Thus, if Descartes were to follow Suarez in saying that God is limited by the natural order, it amounts to claiming that God is limited by himself. His creation of the soul is limited

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276 AT VII 80
only by his creation of nature, both creations which he sustains in existence through every instant of time. To say that God is limited by the order of nature is to say that God is, in a way, subject to his own will. The infinite power employed to create the soul is limited only by his own infinite power employed in the creation of nature, and his continued presence as nature. In this sense, rather than God being limited by a natural order that proceeds along its course without his aid, God’s infinite essence is only outstripped by his own essence. In this way, the elimination of substantial forms in Descartes’ work is able to preserve God’s purely positive nature, and thus save himself from admitting that God’s power is limited in the creation of the soul.

In sum, through His essence God was able to create the soul ex nihilo, and this creation was made in His image. My existence as a thinking thing depends upon Him in that my being originated in Him and I continue to be preserved through His emanating power. Although all finite things are caused by Him and hence are divine in nature, the being of the Cogito is maximally divine in that it resembles God’s being more than any other. As we have seen, this is a direct consequence of the fact that, as a human being, only I have the idea of God, which is the special mark of the craftsman on His work.

The Generation of the Union

Descartes’ correspondence with Regius shortly after the publication of the Meditations reminds us of the general framework in which Descartes situates the union of soul and body. In response to Regius, Descartes writes, “One can only object to you that it is not at all accidental that the human body be united to a soul, but that is its proper nature; because the body having all the dispositions required to receive the soul, without which it is not properly a human body, it
cannot be done without a miracle that the soul is united to the body.”\textsuperscript{277} This is to say, the soul is a substantial form, proportioned to join a properly disposed body. As Article 107 of the \textit{Les passions de l’âme} tells us, the union of these two substance occurs through a bond of love, and just as Suarez, citing the \textit{Timaeus}, understood that the union of two heterogeneous substances requires a ‘third thing’, Descartes believes that love fills this role. The aim of this section is to understand what love is, how the soul loves, and what historical precedents Descartes may have followed in conceiving love as the bond between soul and body. Once these questions are answered, we will begin to have a clear picture as to how it is ‘the proper nature’ of the soul to unite with a body.

Evidence of Descartes’ specific interest in the union of soul and body becomes more concentrated from the publication of his Sixth Meditation in 1641 onward. Insisting that the union of the two substances is a substantial one, this assertion only becomes more adament through his correspondence on morals up until the publication of \textit{Les passions de l’âme} in 1649. The \textit{Passions} is primarily a book in moral philosophy, but because his theory of the passions depends on how the union of soul and body is conceived, the text offers a point of articulation between Cartesian metaphysics and morality. As such, the \textit{Passions} serves as Descartes’ last word on the question of the union, and after its publication he would refer correspondents to this text whenever they inquired about the union of soul and body.\textsuperscript{278}

Descartes had not originally thought that the \textit{Passions} would include a long opening section on the nature of human being. In his correspondence with Chanut from 15 June 1646, Descartes mentions that the \textit{Principles} were supposed to include a section on the union of soul

\textsuperscript{277} AT III, 460-1, see also AT III 505, 567

\textsuperscript{278} See letter to Morus, AT V, 347
and body, and throughout his time working on the *Passions* Descartes believed that the *Principles* and the *Passions* were two texts that strongly overlapped in content. Acknowledging that the *Principles* was supposed to include a section on morality, Descartes goes on to explain, “the notion of physics which I attempted to acquire has largely served to establish certain foundations in Morals.” However, Descartes admits that the *Principles*, as it appeared in publication, was a long way from bridging this gap:

> It’s not that I am not entirely of your opinion in how you judge that the most certain means to know how we must live is to know, first of all, what we are, what the world we live in is, and who is the Creator of the world, or the Master of the house that we live in. But, though I neither claim nor promise, in any way, that all I wrote is true, there is a huge gap between the general notion of sky and earth, that I attempted to give in my Principes, and the particular knowledge of the Nature of Man, which I have not treated at all yet.\(^\text{280}\)

To give this account of the nature of man as a human and not merely as a body is the task of the *Passions*, and so we find Descartes’ most extensive thinking on the mind-body union here.

Again, the *Passions* is where we find his statement on the substantial union of mind and body that we have been investigating all along. Let us reread the passage in its original form:

> Car il me semble que les premieres passion que notre ame a euës, lors qu’elle a commencé d’etre jointe à notre corps, ont deu etre, que quelquefois le sang, ou autre suc qui entroit dans le Coeur, estoit un aliment plus convenable que l’ordinaire, pour y entretenir la chaleur, qui est le principe de la vie: ce qui estoit cause que l’ame joignoit à soy de volonté cet aliment, c’est a dire, l’aymoit.\(^\text{281}\)

When Descartes says the soul ‘loved’ the body, we must understand this passion in the above context: he is treating love in this text in the physical sense, according to the positions he laid

\(^\text{279}\) AT IV 441
\(^\text{280}\) AT IV 441
\(^\text{281}\) AT XI, 407; my emphasis
down in the *Principles*. Fortunately, there are two places where Descartes writes extensively on love: the first is in Part Two of the *Passions*, but the other even more detailed account comes in his correspondence with Chanut. The latter were written as Descartes was casting drafts of the *Passions* in the mid-40’s, and the two sources provide helpful commentary on each other.

Love, according to Descartes, is a passion in the strict sense. That is, it is an affection or emotion of the soul caused by the body, making the soul ‘passive’ to the body’s work. In Descartes’ words, the passions of the soul are “perceptions, sentiments, or emotions of the soul that we relate to the soul in particular, and which are caused, maintained, and strengthened by some movement of the spirits.” As we shall see, love is a passion in this strict sense insofar as it describes a state of the soul when it is united with the body, or what Descartes calls a ‘*pensée confuse*’ in that it depends upon a mélange of the nerves and the soul.

What does it mean to say that the soul’s union with the body is based upon the love felt between the soul and the blood? Descartes explains himself on this point in a long letter to Chanut from February 1, 1647. Descartes has a handful of letters corresponding with Chanut beginning in the summer of 1646. In his first letter Descartes mentions that he is in the midst of working on his “*Treatise on the Nature of the Passions of the Soul*” which we know was an extension of his correspondence with Princess Elisabeth of Bohemia, to whom he eventually dedicated the book. The letter from 1647 is written in response to a question Chanut poses to Descartes which had arisen in a conversation between him and Princess Elisabeth. Chanut

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282 AT, XI 349
283 AT IV 440
284 AT IV 442
reports that the Princess had questioned him on the nature of love and hate, but that his response was unsatisfactory so he turns to Descartes for his opinion on the topic.  

Chanut has three questions: 1) What is love? 2) Is it only natural light that teaches us to love God? and 3) Which of the excesses or bad usages is worse: that of love or hate? Regarding the crucial passage from the *Passions* Article 107, the first question is most relevant, for Descartes will take this opportunity to explain not only the nature of love, but the nature of the union of mind and body. In his explanation, Descartes begins with a distinction between love that is “purely intellectual or reasonable” and that which is a passion – a *pensée* *confuse*. Purely intellectual love is a “*pensée* raisonable” and concerns only the soul, without the body, whereby the soul both knows and wills a good, and it is the movement of the will that accompanies this knowledge that constitutes what Descartes calls ‘joy’. This feeling is produced in and of the soul itself, independent of the body, since it concerns only a consideration of itself with this good. As Descartes explains, joy is the first experience of the soul, as it is drawn to the dispositions and accommodations offered by the body: “because it is not believable that the soul had been placed in the body if not when the body had been well disposed, and that when it is well disposed in this way, this naturally gives us joy.” That is to say, when the body is merely present, the soul experiences joy in the mere consideration of its presence. This aspect of Descartes’ theory of the union is mostly overlooked, although Gueroult for instance is certainly aware of this aspect of Descartes’ work. He devotes only a few sentences to it:

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285 AT IV 582-3


287 AT IV, 605
It is not like the soul is joined to just any matter and forced matter to fit its needs, thereby shaping matter into a living organism. This introduction of the soul into the body must conform to Descartes’ general physics project, which posits a body machine that can largely function on its own. Thus physical nature would produce a very complicated machine, made such that a soul could fit it in some way, without having been a factor in the construction and fitting together of its parts. At the moment when it is inserted into the machine, the soul, by sensing the passion stemming from the action of the matter with which it is united, experiences a sensible joy that testifies to the suitability of the machine that mechanical laws have so perfectly made to receive it.288

However, Gueroult is not totally accurate in his brief remarks. Joy is distinct from love in that love is a “pensée confuse,” which is to say that love is both intellectual and corporeal. As he explains in Article 79 of the Passions, “Love is an emotion of the soul, caused by the movement of the spirits which incite it to be joined willingly to objects that appear to be suitable for it.”289 Thus, the soul does not feel joy, but rather love, when it is united to the body. This is in contrast to the experience of joy or ‘rational love’ in the mere presence of the body, which is not a passion in the strict sense, since it occurs in a disemboedied mind. Only once the body is united and certain corporeal sentiments are relayed to the soul, is the feeling then called ‘love’. Descartes does admit that joy and love are usually felt together, particularly in the case of the initial union of soul and body: “But when the soul is joined to the body, this rational love is ordinarily accompanied with the other, which we can call sensual or sensitive, and which, as I said summary of all the passions, appetites, and sentiments, on page 461 of my French Principles (Articles 189-190, IV) is nothing other than a confused thought excited in the soul by some movement of the nerves, which disposes it to this other more clear thought which consists


289 AT XI, 387
of rational love.” By the time of the publication of the *Passions* two years later, Descartes would call this ‘rational love’ ‘joy’, but the point remains: a *rational consideration* of the object must precede the passion, and this is precipitated by the soul’s union with the body. And although reason and passion are distinct, they continue to be related in experience once the body is ensouled: “But ordinarily, these two loves are found together: because there is such a link between the one and the other that when the soul judges that an object is dignified of it, this disposes the heart to the movements that excite the passion of love, and when the heart is in this way disposed by other causes, this makes the soul imagine lovable qualities in objects where it would otherwise only see defects.” Descartes elaborates on this position in the *Passions* of the Soul in Article 99, where he details the physiological effects that usually accompany love.

Of all the passions Descartes enumerates in Part 2 of the *Passions*, his decision to situate love at the intersection between soul and body is not without precedent. In some ways, Descartes’ treatment of love *en physician* is unique, but as Anthony Levi has noted, he remains heavily indebted to the ancients in his basic approach. This is particularly true in the case of love, although here we find a complex intersection of neo-Platonism, physiology, and scholastic metaphysics, which Descartes then reinterprets through his mechanist physics. The discourse on love that is most pertinent here has its roots in Plato’s *Symposium*, although the interpretation Ficino provides in his 15th century *Commentary on Plato’s Symposium on Love* is far from both Plato’s original text and our modern day Plato scholarship.

In searching for a theory of love that situates love between a divine entity like the soul and a material entity like the body, Socrates’ speech in the *Symposium* is particularly

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290 AT IV, 603

291 AT IV, 603
enlightening. In the *Symposium*, when Socrates gives his speech on love it is in the form of a conversation with the goddess Diotima. When Socrates had asked Diotima, “What is Eros?” it is made clear that Eros is not a God, as previous speakers had assumed, but rather a ‘daemon’. That is, Eros is a being that is neither a human nor a god, who possess a special power to act as an intermediary between gods and human beings in all of their different relations. The conversation proceeds as follows:

*Socrates*: “What would Eros then be?” I said, “A mortal?”

*Diotima*: “Hardly that.”

*Socrates*: “Well, what then?”

*Diotima*: “Just as before,” she said, “between mortal and immortal.”

*Socrates*: “What is that Diotima?”

*Diotima*: “A great daemon, Socrates, for everything daemonic is between god and mortal.”

*Socrates*: “With what kind of power?” I said.

*Diotima*: “Interpreting and ferrying to gods things from human beings and to human beings things from Gods: the requests and sacrifices of human beings, the orders and exchanges-for-sacrifices of Gods; for it is in the middle of both and fills up the interval so that the whole itself has been bound together by it.”

In this context, Eros is a kind of third-term that bridges the gap between the divine realm of the gods and the mundane realm of the human. This is a status that Eros receives through her peculiar ancestory, being the son of Penia and Poros. As the story goes, Penia, or Poverty, decided she would seduce Poros, or Resource, at a party thrown for Aphrodite so that her

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newborn would have the proper resources. She lay beside Poros in Zeus’ garden after Poros was drunk, and she became pregnant with Eros. From this parentage, Eros acquires a kind of middle position, being half Poros and half Penia. Diotima gives an extended description of his intermediary position, stating,

First, he is always poor, and far from being soft and beautiful as the many suppose, is hard and dry and shoeless and homeless, lying on the ground without bedding in the open air, sleeping in doorways and on highways, having his mother’s nature always cohabiting with want. But, like his father, he plots for the beautiful and good things, is manly, impetuous and high strung, a clever hunter, always weaving some stratagem, a desirer of and resourceful concerning prejudice, philosophizing throughout his whole life, a clever juggler, purveyor of drugs, a sophist. His nature is such that he is neither immortal nor mortal, but at one time on the same day he flourishes, when he has plentiful resources, and at another time, he dies, but he comes back to life again because of his father’s nature. He is always getting resources but they are always flowing out. So Eros is neither without resource nor is he ever rich; he is in the middle between wisdom and ignorance.²⁹³

Though Plato scholars will point out that this is an important description of Socrates, our concern is with how this conception of Eros is received by the Scholastics. By the 15th century the middle position between wisdom and ignorance is reinterpreted as a middle position between form and formlessness, with the divine realm being the world of Forms, while the matter of the mundane realm is a kind of “chaos”. Through love’s mediation, these two worlds were brought together to create the formed world we know: “[T]he Matter of this World, although in the beginning it lay a formless chaos, without the ornament of Forms, immediately because of a love

²⁹³ 203c-e
innate in itself, it directed itself toward the Soul and offered itself obedient to it, and through this conciliatory love, receiving from the Soul the ornament of all the Forms which are seen in this world, from a chaos became a world.”

Ficino continues to press this point throughout the text, such as when he later states, “Because, just as the daemons are midway between heavenly things and earthly, so love occupies the middle ground between formlessness and form.” This framework prepares Ficino’s commentary devoted to Diotima’s speech addressing the role of love in the union between soul and body.

Rehearsing the place of Eros as a kind of middle ground, Ficino continues to broaden the scope of its mediating capacities: “For the previous speakers have called love beautiful, good, blessed, and a god. Socrates and Diotima deny this and they place love midway between the beautiful and the ugly, the good and the bad, the blessed and the wretched, god and man.” For Ficino, the poles of the beautiful and ugly and god and man are the most significant to the union of soul and body. When the soul sees a beautiful object, and possesses an image of it, the soul can only then be said to love that thing. For if the soul has no image of the thing, then it cannot be said to love it, as it is unknown. But if the soul possesses the thing itself, it no longer is bothered by the pangs of love, as no one longs for anything he already possesses. “It follows that the soul catches fire with burning love only when it has found some attractive image of a beautiful thing and is incited by that foretaste to full possession of that beauty. Therefore, since the soul of a lover partly does possess the beautiful object and partly does not possess it, the soul is thus obviously partly beautiful and partly not beautiful. And thus because of this mixture, we say that love is a certain emotion halfway between the beautiful and not beautiful, participating


295 Ibid, 109

296 Ibid 109
in both.” That is, the soul can only be said to bridge the gap between the two poles insofar as it does not possess the entity but as an image. The role of the image is of crucial significance not only for Ficino’s understanding of the soul-body union, but Descartes’ as well. Let us turn to Ficino’s account of the soul’s origins and its juncture with the body to see where love stands between God and man.

Ficino’s account of the soul-body union is heavily enmeshed in the astrology, physiology, and theology of his time, and he follows the now familiar assumption that the soul is created by God. However, he adopts the idea that in its descent toward the body the soul is wrapped in a certain “astral body” or spirit. The soul, encased in spirit, is then transported from the heavens down to earth by the daemons. While the daemons are the transportation, the spirit covering the soul is what permits it to join with the body: “As they fall from the Milky Way, through Cancer, into the body, they are wrapped in a special transparent astral body; swathed in this wrapping, they are enclosed in earthly bodies. For the order of nature requires that the perfectly pure soul is not able to descend into the impure body until the soul receives a certain mediating and pure covering. This covering, since it is coarser than the soul, but purer and finer than the body, is regarded by the Platonists as the most appropriate link between the soul and its earthly body.”

This theory of the soul’s transport is widespread enough that Fernel mentions it in his discussion of spirit that we examined in Chapter 2. Citing the Aristotelians instead of the Platonists, Fernel writes, “They considered that before or soul [animus] (the work of the supreme craftsman of things) appeared and entered into this compact solid body, it was clad in some shining body, pure and starlike, as a simple garment, and this, being immortal and eternal, could never be parted

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297 Ibid
298 Ibid 112
from the soul, which could not become an inhabitant of this world without it.”\textsuperscript{299} This “garment” is precisely the same spirit that supersedes the material elements of the semen, and which comes to form the heart and eventually reside there. Because the spirit has a divine \textit{and} a mundane presence, it can serve as an intermediary between soul and body. On Ficino’s account, the soul encased in spirit then falls into a properly disposed body. Ficino’s account of this event is heavily influenced by astrology, but what is most interesting is how the soul actively imprints its image in the spirit, and the soul-spirit union then imprints this same image on the seed, and thus the soul, the spirit encasing the soul, and the seed all come to bear the same image. As Ficino explains, “Any soul which falls into its earthly body under the domination of Jupiter conceives of itself during its descent a certain pattern for making a man corresponding to the star of Jupiter. This pattern the soul is able to imprint very exactly on its astral body because that is very well disposed to receive it. If the soul finds on earth a seed which is similarly well disposed, the soul then imprints on that seed a third image.”\textsuperscript{300} If we recall the role of the image in Ficino’s account of love’s status between the beautiful and the ugly, we see that the soul’s impression of its likeness on the seed puts it in a position to form a bond of love with the seed: “The soul thus stricken recognizes the image before it as something which is its own … The soul then puts the visual image beside its own interior image, and if anything is lacking in the former as a perfect copy of the Jovial body, the soul restores it by reforming it. The soul then loves that reformed image as its own work.”\textsuperscript{301} Here the soul’s love for the body is based upon the soul ‘seeing’ the body as its own kind.

\textsuperscript{301} Ibid
The union of love thus occurs through a kind of ‘branding’ of the seed by the action of the soul on passive matter, and when the soul recognizes its mark, it goes to the seed and unites with it. In this way, an ensouled human being is formed. It is only through this process whereby

1) the soul imprints its image on the astral body or spirit, 2) The union of soul and spirit imprints its image on the seed, and 3) The soul recognizes this image as its own and then unites to it, that the soul is able to mesh with a body. Both spirit and love are essential to the process as go-betweens for the two heterogeneous substances of soul and body. In fact, the two terms are synonymous in that spirit is the transport of soul, working as the daemon ferrying entities from God to earth, just as Eros is said to do. Just as physiologists had thought the spirit to be the bond between soul and body, Ficino’s work on the passions posits love in this very same role. In this tradition, it is not surprising that Descartes would choose the passion of love as the go-between or ‘third term’ between soul and body, since there was already significant precedent for this theory, carrying the authority Plato and Socrates. Yet Descartes clearly cannot adopt this thinking without overhauling all of its mystical elements. Thus, in Descartes’ own thinking the spirit is not an astral body, the astrological components are removed, the soul descends from God in a naked form, and the body has no supernatural spirit welcoming the soul to join it. None of this is permitted by the mechanistic paradigm, which reduces everything but the soul to matter and motion. What Descartes is left with is a theory of perception, the image, and love which he draws upon and develops in the context of his own thinking.

As we have discussed, Descartes begins his theory of love by distinguishing a rational from a confused form of love. In the crucial letter on love to Chanut from 1 February 1647, we learn that the role of perception and the image of the body is the prerequisite of the soul’s movement toward the body, language that is repeated in the Passions. This is evidenced by
Descartes’ choice of words for both the action of the soul as well as the object. Often times he refers to the loved object in terms of its presence or as a representation: “And the consideration of a present good excites Joy in us, a present bad excites Sadness…”\(^{302}\) and “But when a thing is represented to us as good in respect to us, which is to say, as being amenable to us, that makes us have love for it; and when it is represented to us as bad or harmful, that excites Hate in us.”\(^{303}\) Regarding the action of the soul in representing the object, Descartes writes to Chanut almost three years before the publication of the Passions: “Love is an emotion of the soul, caused by the movement of the spirits, which incites it to be joined willingly to objects that appear [paroissent] to be amenable to it.”\(^{304}\) Descartes uses several terms interchangeably to characterize how objects ‘appear’ to the soul before the soul bonds to them. In the Passions Descartes writes, “The first [moment], it seems to me is nothing other than when our soul catches sight [apercoit] of some good, be it present or absent, that it judges amenable to itself, and it is joined to it willingly, which is to say, the soul considers itself with this good as a whole of which it is a part and the good the other part.”\(^{305}\) As Descartes goes on to clarify, this representation, consideration, or sight of the body is not a matter of physical vision. The soul does not have eyes and the vision Descartes is describing here is not the vision he described in the Optics. The seeing that occurs in love is a thinking of two parts that belong together: “by the word ‘willingly’ [volonte], I do not mean to speak here about desire, which is a separate passion and is related to the future, but of the consentment by which we consider ourselves at the present as joined with what we love: in the way that we imagine a whole, of which we think [pense] to be only a part,

\(^{302}\) AT XI, 376, my emphasis  
\(^{303}\) AT XI, 374, my emphasis  
\(^{304}\) AT IV, 387, my emphasis  
\(^{305}\) AT XI, 387, my emphasis
and that the thing loved is another part.” To catch sight of the body, to conceive it, to represent it, for the body to be present are all ways of Descartes saying that the body must first be thought by the soul before it loves it. The soul must think itself, see itself, and think the thing loved. As Article 107 explains, the object loved is the blood that works as a fuel to heat the heart. Hence, in the union, the soul must think itself and the blood as a part of a whole.

In what sense does thought ‘see’ the body? We saw how in Ficino’s work, love was the bond between soul and body only once the soul had reproduced an image of itself in the seed, which it then bonded to. As Descartes thinks the union, the soul must ‘see’ the body as a good that it can then join itself to. As we know, it does not ‘see’ and love the whole body, but rather it first joins itself to the blood that is responsible for the heat in the heart. This ‘seeing’ is a thinking in a very rigorous Cartesian sense of the word, as it is presented in the Meditations.

Considering that the language in the Passions is borrowed from his earlier correspondence with Chanut, we must keep in mind that Chanut certainly had not read the Passions at time of their correspondence. However, we do know that he was intimately familiar with the Meditations, published five years earlier. Here we learn that Descartes understand the Cogito in the very specific sense of perceiving, and in the case of the mind-body union, the mind must think the body in the sense of representing the body to itself. This thought or representation is a perception. As Martin Heidegger notes, this term, percipere, is substituted for the word cogitate in many significant passages in the Latin Meditations. For example, in thinking the wax, Descartes specifies this action as a kind of perception: “But I need to realize that the perception of the wax is neither a seeing, nor a touching nor an imagining. Nor has it ever been, even though

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306 AT XI, 387, my emphasis
307 AT IV, 583
it previously seemed so; rather it is an inspection on the part of the mind alone."\textsuperscript{308} All thinking for Descartes, all knowledge of bodies is a kind of “perception on the part of the intellect."\textsuperscript{309} A final example, though there are many, appears when Descartes states, “For since I now know that even bodies are not, properly speaking, perceived by the senses or by the faculty of imagination, but by the intellect alone, and that they are not perceived through their being touched or seen, but only through their being understood, I manifestly know that nothing can be perceived more easily and more evidently than my own mind.”\textsuperscript{310} This verb, per-capio, is truly a kind of ‘capturing’ or an active taking-possession of a thing. Similar to the way Ficino thought the soul actively branded the seed with its image, Descartes believes that the soul ‘thinks’ the body insofar as it seizes it, and brings the object to itself. The soul represents the body insofar as it presents it to itself, brings it before itself, making it visible. As Heidegger explains, “When Descartes grasps cogitatio and cogitare as perceptio and percipere, he wants to emphasize that bringing something to oneself pertains to cogitare. Cogitare is the presenting to oneself of what is representable.”\textsuperscript{311} These perceptions represent the object, and in so doing the soul that represents must be present along with the object; that is, the soul is always ‘there’ involved in every act of thought. The soul is already there before the object has been represented, for the soul must be present so that the representation can be ‘caught’ and brought before the perceiver. This is why Heidegger says that the essence of this kind of representative thinking is simple and unitary,\textsuperscript{312} for it involves two things that ‘belong together’, namely the soul that perceives and the body that is perceived.

\textsuperscript{308} AT VII, 31
\textsuperscript{309} AT VII, 60
\textsuperscript{310} AT VII, 34; See also, AT VII, 8, 35, 161
\textsuperscript{312} Ibid 107
This is not to say that the soul is joined to every object it perceives in a bond of love – love is a bond that goes beyond mere thought. Yet it is to say that the soul needs a kind of ‘seeing’ that establishes it as the act to the body’s potentiality. And insofar as the soul must ‘catch sight of’ an object before it can love it, we must say that just before the soul joins with the body, then the soul must think the blood in the specific sense of cogitare before it can join with it. The blood is not necessarily the soul’s first thought, but it is its last thought qua soul before it is embodied. That is to say it must bring the blood before itself and represent it in the mind. Therefore, the body must be in the soul before the soul can be in the body. Of course, this is not a physical encasement of the body but rather a cogito as percapio, or a capturing of the blood in the soul, which only the lets the soul love the body and unite with it. Husserl understood this kind of containment accomplished by thought when he wrote in his Cartesian Meditations, “Each cogitatum, each conscious process … means something or other and bears in itself, in this manner peculiar to the meant, its particular cogitatum … Conscious processes are also called intentional; but then the word intentionality signifies nothing else than this universal fundamental property of consciousness: to be conscious of something; as cogito, to bear within itself its cogitatum.”

As the soul comes to love the body, the soul ‘bears it within itself’ as a representation, and upon recognizing its suitable disposition, it loves the body. It is the representation of the body, specifically the blood, that allows Descartes to say that the soul has the body and yet does not have it. This is the ‘midway point’ that must be reached in order for love as a passion to be gained. In this way the body is ensouled.

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Let us recount our progress hitherto. We have seen that the Scholastics saw themselves following Aristotle in studying nature in terms of substantial forms. Insofar as substantial forms govern the behavior of bodies, this approach focuses on how and why certain changes occur in nature. No change is more curious than the generation of a completely new form. In resolving the issues surrounding substantial generation Suarez was led to posit two types of generation and two corresponding types of union between form and matter. Our concern, the union of the rational soul to the human body entails certain dispositions or accommodations so that the material body can serve as a welcoming abode for the divinely produced soul. Fernel, following tradition, had thought that the primary disposition was a certain vital spirit which bore with it an innate heat. This spirit, with its material and divine aspects, drove the process of generation, ultimately concentrating itself in the heart. Harvey, who thought that spirits could not be empirically verified, gave this same role to the blood. Descartes accepts much of this framework, if we understand that in the broadest sense. He agrees that the soul is produced by God ex nihilo, out of his infinite power. Produced by God, sustained by God, and bearing his likeness, the soul joins with the earthly body by falling in love with a certain fuel in the heat of the heart. Eschewing Fernel and following Harvey, Descartes believes this liquid to be the blood, which heats the heart through a special process of fermentation. As with Fernel, the warm nature of the heart derives directly from the process of insemination. In Fernel’s thought, this heat forms on account of a concentration of spirit in the semen that goes on to form the heart. Thus, Fernel can claim that the soul joins with the heart because the heart’s heat has this dual nature, both divine and mundane. It is no accident that the rational soul bonds with the human body. However, in Descartes’ mechanical physics of the body, he eliminates any divine material from the semen; the semen is composed only of particles. Although these particles are mainly the fiery particles
of the first element; they have no dual nature. Hence for Descartes, the semen, and in turn the *feu sans lumiere* of the heart must be identical to other elemental fires found in inorganic material such as wine or hay.

Meanwhile, the soul is thought to arrive from God’s hands and ‘love’ this elemental heat. This too has its precedent in Scholastic writing, namely in Ficino’s commentary on the *Symposium*. Love is the correlate of spirit insofar as love is a daemon responsible for transporting the soul to the body, uniting them. But this love cannot be accomplished without Ficino presuming a certain divine spirit that comes to reside with the seed, allowing the soul to join the body. However, in Descartes’ overhaul of Scholastic physiology, he has lost the physiological correlate of love. There is no longer a divine spirit to differentiate *this* body as the object of love. And although the soul may have the power to ‘capture’ the body, there is no explanation as to why *this* heat, *this* fuel, and *this* blood is the object of its love. In eliminating the ‘third term’ from the body, a direct result of his reconception of insemination, Descartes posits love as an intermediary without any associate on the side of the body. This is because the body is not made in order to accommodate the soul – the body is not made for the sake of anything at all. This is the crucial modification Descartes makes to the Scholastic view of the body, as the latter was based on the belief that “The body of each living thing, and especially the human body, is constructed for the sake of the soul, not just as its lodging, but also as the instrument suited to display its resident powers.”  

By sacrificing the teleological nature of the semen and thus the blood, Descartes is without an explanation of how *this body* accommodates the soul.

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Therefore, the soul may love, but it is lost in what it loves. Why does the soul not love hay or wine? Why does it love this body – my body? The mind-body problem is not so much the problem of love as it is the problem of self-love. How do I come to love myself when the body, its heat, and its blood emerged out of particles that are absolutely this-wordly? Stating that the mind-body problem is the problem of self-love, a problem rooted in generation, delivers us a long way from the 20th century mind-body discussion. Let us turn now to how that discourse emerged, and what these scholars may have overlooked in their prioritization of the brain over the blood.

Works Cited


CHAPTER 4
The Significance of the Problem

Regarding the nature of the union of mind and body in Descartes’ thinking, it is impossible to ignore the crucial role his theory of generation plays. First, by following the Medieval tradition and claiming that the soul is produced rather than educed, Descartes must find a way to merge the divinely created mind with the mundane body inherited from the parents. In any case, even though Descartes can provide a coherent account of how the body is inherited from the parents and the mind from God, he cannot overcome the hurdle of explaining how these two lineages merge to create the substantial union of mind and body. Here Descartes runs aground in his conception of the blood, which is ultimately derived from the semen, which is understood under the mechanistic paradigm. This theory of production would be discounted as pseudo-science in the coming centuries, leading mind-body theorists back to grapple with the problems of an educed soul. In a way, the role of the blood remains fundamental to the problem even once science seriously begins to consider the possibility of an educed soul. That is to say, the possibility of a mind inherited from the parents and bearing the marks of their craftsmanship rather than God’s finds its roots in the science of bloodlines endemic to modern theories of race.

These themes are not part of what we recognize today as the ‘mind-body problem’, or ‘Descartes’ dualism’, and it is certainly not what we have in mind when we speak of ‘Descartes and the mind-body problem.’ However, our arrival at this juncture is not at all accidental. In the intellectual climate that dominates philosophy, and especially the history of philosophy, two tendencies dominate the approach to the problem. The first is the tendency to analyze and formalize arguments explaining the union and the second is the tendency to write a narrative history of solutions. Both of these approaches contribute to the edification of a particular reading
of Descartes. Either he represents a kind of dark period for the history of the philosophy of mind, or his arguments for dualism and the union of mind and body are perpetually restated, reanalyzed, and supplemented by contemporary science to provide the most charitable and coherent argument possible. Whether Descartes is demonized in a narrative of the history of mind or credited with the ‘solution’ to the mind-body problem, what our discourse consistently lack is any rigorous philosophical notion of the problem itself. Books and articles proceed as if everyone knows what the mind-body problem is, and the philosopher’s burden is either to solve it or retell its history. As a result, a general theory of problems themselves has never been brought to bear on the mind-body discourse. This is the task we now turn to.

Having articulated the problem as concretely as possible in the previous three chapters I hope not to disappoint the reader by entirely forgoing any kind of ‘solution’ to the question. The problem of self-love, rooted in Descartes’ theory of generation will remain to the end of this essay. This is however, a great success from the philosophical standpoint, and it is the aim of these final pages to explain why. To begin to appreciate the problem we must discuss the importance of a historical method that neither attempts a narrative nor a formalization of an ‘argument’; we must begin by first returning to the philosophers and historians of science who have insisted on the preeminence of problems over solutions, and the importance of histories that insist on making problems over finding solutions. With a firm philosophical understanding of problems as positive, generative phenomena rather than as a sign of our lack of knowledge, we will turn back to our contemporary Descartes scholarship to see what price is paid when philosophers prioritize the solution and allow the problem to devolve into a cliché. Finally, we will peek into the work of a 19th century philosopher, Francis Galton, to remind ourselves that not everyone has forgotten the problem of generation in the history of the mind-body problem.
As Galton knew well, the question of how the soul is inherited with the body, and how the soul can be classified, like the body, into certain types is precisely what comes to be known as ‘race theory’.

**Three Approaches to the Problem**

Certain veins of philosophy today approach history with the intent to extract arguments from canonical figures. The mind-body problem, especially in Descartes oeuvre, is always a prime candidate for such treatment, but we can also think of the problem of free will, the proof for the existence of God, the argument for rationalism, amongst others, all of which are ‘found’ in Descartes. It is commonly thought that the mind-body problem originated with Descartes, and by this it is usually meant that he first discussed how the metaphysical soul interacts with the physical body. However historically inaccurate that may be, this approach to history seems to always want to restate the original argument as clearly as possible, which often means employing logical notation, and distilling the argument into a neat proof that can receive a shorthand title: ‘The No Problem Argument’, ‘The Special Cognition Doctrine, ‘Integrative Dualism’, or ‘The Union Dependence Doctrine’. These interpretations are thought to be further clarified by the absolute annihilation of the historical context in which the author wrote, the texts he studied, and the social issues that guided his inquiries. The assumption behind this approach to history is first and foremost the belief that the context that gave birth to an original idea can be subtracted without sacrificing the integrity of the original idea or argument. The argument is best understood once it has been excavated from its historical cite and brought into the context of 20th century philosophy. As I will demonstrate in this next section, this is the most common approach
to Descartes both for historians of the mind-body problem as well as 20th century philosophers of mind.

Another less common approach can occasionally be found which tries to provide a context in the form of a narrative of the history of the soul, or the mind, or even the brain. Paul MacDonald’s History of the Concept of Mind is a fine example of this kind of work, wherein he traces the concept of the soul from the Homeric period through the 18th century. This approach traces a concept through various periods and philosophical figures. Although the concept of the soul is vague and changes meaning through time, we can only witness these changes by assuming something identical that the word ‘soul’ denominates. In this sense, the narrative approach is closest to the most popular form of historical writing, the biography. Concepts are approached like people who are self-same through time as they undergo certain adventures, crises, and rebirths. The narrative approach, unlike the aforementioned analysis of arguments, aims to tell a story – a kind ‘what happened’ to the soul. In tracing a particular subject through various periods this approach to history is rooted in chronological time, where one event occurs after another, and in this way the tangle of events that comprise the career of the soul is brought to light. These events, such as Plato’s Theory of the Tripartite Soul, Descartes’ Dualism, or Hume’s Skepticism all derive their significance from the context of the narrative being told. Because the events derive their significance from their position on the axis of the narrative, the narrative style assumes the historian’s task primarily to be that of constructing the appropriate narrative such that events are illuminated as clearly as possible. Because each event takes its significance from other events in the narrative, it is essential to choose the events that will give the narrative its proper texture. In the case of the mind-body

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problem, the history of events that compose its narration all derive their significance from one event in particular: the present discourse on mind and brain. All events in the narrative, and Descartes is an especially good example of this, derive their significance from the final event of the narrative. This turns the narration into a kind of teleology whereby events are given significance based on how well they illustrate the present discourse on the philosophy of mind. That is, the study of Descartes is for the sake of an understanding of the present problem. In thus imposing the present situation on the past as a teleological approach must, the historian cannot help but impose our present day concepts, values, and goals onto the past. Unlike the impulse to restate and formalize arguments, the narrative approach is dangerous because it gives the look of a ‘total’ study, or a complete history of a discourse, when actually all that has occurred is the present day discussion of mind and body has been imposed on historical material such that only events significant to that discourse appear. Through this ruse, philosophy is often times tricked into repeating its history as the present, thereby annihilating history in favor of the present.

Aside from the attempt to extract and formalize arguments and the narratives that organize events along a timeline culminating in the present, there is at least a third approach. It is adopted and expounded upon by a number of historians including, Francois Furet, Henri Bergson, Gaston Bachelard, Georges Canguilhem, Michel Foucault, and Gilles Deleuze. It can be called any number of things, but let us follow Furet in naming this approach ‘problem-oriented history’, since that best describes the value underlying the method. As we might have guessed, this approach prizes a well-formulated problem above all else, including the temporal and factual aspects of history, or even the solution itself.

316 See Furet, Francois. In The Workshop of History. Translated by Jonathan Mandelbaum. The University of Chicago Press: Chicago, IL. 1984. “All narrative history is a succession of original events or, if one prefers, a history of events. And all history of events is teleological history: only the ‘ending’ of history makes it possible to choose and understand the events that compose it.” p. 56

317 Ibid, 56
How are problems significant to history? While many might believe that arguments and premises are *given* in historical texts, remaining there only to be excavated and polished, or that a series of events can be organized such that they logically terminate in the present discourse, problem-oriented history begins with the understanding that researchers do not collect facts pell-mell. Historians and scientists alike conduct experiments, collect data, and approach nature always with a problem in mind. In the previous chapter of this study, we have seen how scientists and philosophers approached the concept of spirit and formulated it with particular questions in mind: What gives matter the impetus to grow and form a new living being? What accommodates the soul into the human body? Formulating these problems and their essential interdependence has been the primary task of this dissertation. The problem, best captured by Descartes in the question of love discussed in the previous chapter, then gives rise to a certain set of facts or experiments that must be conducted. This is equally the case for the more traditional problem of the interaction between brain and mind. Either way, the arguments and solutions are never fundamental – rather it is the problem that gives rise to certain sets of facts that may be marshaled in service of a solution. In this way, problems are always fundamental. Contrary to the tendency to track the arguments that lead to solutions, it is the problem that must be tracked, recast, and posed, even where the philosopher or scientist himself could not fully articulate the problem he was faced with. A historian who approaches history from the perspective of problems understands that all historical facts are in fact constructed in the service of problems, and every piece of knowledge is an answer to a specific question. Without a question or a well-formed problem, there is never any scientific or historical knowledge to be had. In this sense, an approach to history that prioritizes problems is ‘constructive’ rather than descriptive. Concepts and facts are generated by the problem they are designed to solve. This is why Furet writes,
[the historian] constructs his own object of study by defining not only the period – the complex of events – but also the problems that are raised by that period and by those events that need to be solved. He therefore cannot avoid a minimal amount of explicit conceptual elaboration: a good-question or a well-formulated problem is becoming more important – and still less common! – than the skill or patience needed to bring to light an unknown but marginal event.\(^{318}\)

Historians must look at the material of history in a context. Abstracting events from their historical context and honing the argument into a well-ordered set of premises and conclusions has the opposite effect of making the point more clear: without a rigorous explanation of why a discourse took place, without clarifying what problem it was hoping to solve, it is obscured beyond recognition.

**The Common Formulation of the Mind-Body Problem**

But is just this kind of problem-oriented history not what is being done today? Is the discourse surrounding mind and body today obsessed with nothing other than the *problem*? We rarely see books entitled, “The Mind-Body Answer,” but we find many directed at the problem. Yet this is misleading. These books rarely, if ever, tarry over the nature of the problem. In Descartes studies in particular, it is assumed that everyone already knows what the mind-body problem is. We have had it taught us, we have taught in back, and after passing through so many hands for so many decades, the problem is so well-worn that its details and distinctive features are beyond obvious. We all know that the mind-body problem is the question of how the mind

interacts with the brain, and every day more articles, books, and conferences are produced edifying this doctrine not only in philosophy, but psychology and neuroscience as well.

We can of course trace this problem of interaction to Descartes’ work, and even to Augustine and Aquinas before him. It appears, in a form, in Hume, Locke, Schopenhauer, and other canonical figures of the Modern period. Yet the formulation of the problem that is most dominant today comes to us through the key players of Anglophone philosophy in the 20\textsuperscript{th} century. Most notable in this regard is Herbert Feigl, who in his 1958 essay “The Mental and the Physical” tried to articulate and define the essence of the problem and what might then count as a solution. This is in many respects an important essay, but none more so than the fact that Feigl defines the discourse up to today. The essay offers no solution to the problem, but insofar as it defines the problem more clearly than anyone else, it deserves a kind of privileged status in the contemporary mind-body debate.

Feigl begins his essay declaring the he will “indicate what I consider the sort of requirements for an adequate solution to the mind-body problem.”\footnote{Feigl, Herbert. “The ‘Mental’ and the ‘Physical’.” In Minnesota Studies in the Philosophy of Science Volume II: Concepts, Theories, and the Mind-Body Problem. Edited by Herbert Feigl, Micheal Scriven, and Grover Maxwell. University of Minnesota Press: Minneapolis. 1958. p. 373} He makes clear that the solution to this must address the problem of efficacy between the phenomenal and physical realms: How does the mind effect the body? Or in Feigl’s words, “Any solution to the mind-body problem worth consideration should render an adequate account of the efficacy of mental states, events, and processes in the behavior of human (and also some subhuman) organisms.”\footnote{Ibid, 388} This formulation of the problem and the delineation of what should count as an appropriate solution lends itself to a slew of theories already in development at the time of Feigl’s writing, including materialism, mentalism, mind-body interactionism, evolutionary emergence theories,
psychneurological parallelism, and neutral monism. Whatever the solution may be, the problem remains: How is the phenomenal realm of experience related to the physical realm of neurobiology? This question brings with it a host of other dualisms and the question of how these sub-dualisms interact. For instance, what is the relation of the subjective to the objective realm? How does the non-spatial effect the spatial? How does the qualitative emerge from the quantitative? How does the intentional interact with ‘blind’ or nonintentional matter? Whichever question suits us, the essential problem is always one that focuses on the fully formed, adult human being, and the two-way efficacy between brain and mind.

Outside of Feigl’s groundwork, we find many solutions to the problem, but scarcely any extensive challenges to the problem itself. It is as if after Feigl, the master had set the problem and it was now the task of class to solve it. That said, there are number of articulations of the solution to how the mind relates to the body. Of course, by the late 20th century the prevailing view on the matter is some form of Naturalism which posits mental phenomena as a variety of physical phenomena, with the hypothesis that all facets of phenomenal experience are completely describable in terms of the physical sciences. This hypothesis rests upon an affirmative answer to the related question, “Is the mental just the physical?” The ‘physical’, of course, refers to the brain, which is given pride of place when ‘body’ is spoken of. Colin McGinn illustrates the question well when he introduces the problem at the opening of an essay:

The specific problem I want to discuss concerns consciousness, the hard nut of the mind-body problem. How is it possible for conscious states to depend upon brain states? How can Technicolor phenomenology arise from soggy grey matter? What makes the bodily organ we call the brain so radically different from other bodily organs, ay the kidneys –

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321 Ibid, 371
the body parts without a trace of consciousness. How could the aggregation of millions of individually insentient neurons generate subjective awareness?\textsuperscript{323}

The tendency that begins with the question of how the mind can interact with the brain, and why the brain is a unique organ in that it seems to be the seat of consciousness, lends itself to Naturalism because once the mind is inserted in the world of physics, chemistry, and biology, its causal efficacy is no longer a problem. The ‘mind’ can be treated just like any other bit of matter, and its cause and effect relationships can be measured and manipulated as with any other organ.

This lends itself finally to a seemingly different formulation, but one that boils down to the same problem of efficacy and interaction. This formulation locates the problem in our inability to fit the mind in the ‘natural order’, which is the order of physics, chemistry, and biology. Syndney Shoemaker exemplifies this emphasis on the problem well when he writes,

In common with many other contemporary philosophers, I see the mind-body problem not as the problem of how a non-physical mind can interact with a physical body, but rather as the problem of how minds can be part of a fundamental physical reality [...] More generally, it is the problem of how distinctive features of the mental – intentionality, consciousness, subjectivity, etc. – can have a place in a naturalistic worldview which sees the mind as a product of biological evolution and as having a physic-chemical substrate in just the way other biological phenomena do.\textsuperscript{324}

As we shall see, Shoemaker is over a century late in emphasizing the issues surrounding the mind as a product of evolution. But in Shoemaker’s work, once we have dissolved the mind into physical reality, we shall then be able to understand how it is effected by the world and how it in turn effects its body. These philosophers do not consider the history of this discussion in Suarez or Descartes’ work, they do not recognize the eugenic tradition as the birth of their line of questioning, and instead they ask the question of inheritance only to then obscure it with the


problem of interaction. That is, once we can understand how the mind is subject to the same laws as other parts of the body, we can then recognize its effects as that of any other organic thing. In this way, Feigl’s problems of efficacy and interaction are solved.

This mind-body discussion dominates the contemporary understanding of Descartes. Once the aforementioned framework is articulated, it is the historian’s job to trace its history, and this is done by highlighting the appropriate moments in history where the problem has already been addressed. This search for precursors never fails to include Descartes’ writings, where from an early age we are taught how Descartes introduces the mind-body problem to philosophy through his ‘dualism’. Our introductory classes and textbooks teach us something about how Descartes believed in two kinds of stuff – minds and bodies, which he assumed could interact and constitute one complete human being. He assumed that mind could cause movements in the body, and that events in the body could cause thought. This was his naïveté, as he failed to consider all of the philosophical problems inherent in such a position stating that the metaphysical mind could interact with the physical body. He ignored the problem until his contemporaries, Gassendi or Princess Elisabeth of Bohemia, questioned him on it, to whom he responded by escaping the criticism through a theory of ‘primary notions’, or worse, through the physiology of the pineal gland.

This story is not baseless, but it does focus on a very narrow selection of Descartes’ corpus. It finds its impetus in the modern day formulation of the problem that insists that it is a problem of interaction between mind and brain, and then recognizes itself in Descartes’ correspondence with Princess Elisabeth. It seems that no discussion of the problem is complete with mentioning Elisabeth’s question:

I ask you to please tell me how the soul of a human being (it being only a thinking substance) can determine the bodily spirits, in order to bring about voluntary actions. For
it seems that all determination of movement happens through the impulsion of the thing moved, by the manner in which it is pushed by that which moves it, or else by the particular qualities and shape of the surface of the latter. Physical contact is required for the first two conditions, extension for the third. You entirely exclude the one [extension] from the notion you have of soul, and the other [physical contact] appears to me to be incompatible with an immaterial thing.325

This is usually supplemented by Gassendi’s Objection and Descartes’ lack of a concrete response. This is certainly a problem in Descartes’ work, but as we have seen, it is certainly not the only problem concerning the union of mind and body. Now that we have seen how the 20th century has formulated the problem, let us turn to how they impose this formula on Descartes, thereby making these passages the crucial evidence implicating Descartes as a precursor to the 20th century discussion.

There are many excellent texts on Descartes and the mind-body problem whose authors have contributed to my work. The most common version comes from the philosophers of mind. Jaegwon Kim tells us,

Giving an account of mental causation – in particular, explaining how it is possible for the mental to exercise causal influences in the physical world – has been one of the main preoccupations of the philosophy of mind over the last two decades. The problem of course is not new: as we learn early in our philosophy classes, Descartes was confronted forcefully by his contemporaries on this issue, to explain how there could be causal transactions between mind and bodies. […] His problem, as his contemporaries saw, was to show just how his all-too-common-sensical thesis of mind-body interaction was tenable within his ontology of two radically diverse domains of substances, minds and bodies.326

This follows suit with Ryle’s assessment, who labeled the problem “Descartes Myth” in 1949.

According to Ryle the problem concerns:

Minds are things, but different sorts of things from bodies; mental processes are causes and effects, but different sorts of causes and effects from body movements […] there was from the beginning felt to be a major theoretical difficulty in explaining how minds can

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influence and be influenced by bodies. How can a mental process, such as willing, cause spatial movements like movements of the tongue: How can a physical change in the optic nerve have among its effects a mind’s perception of a flash of light?\textsuperscript{327}

It is not surprising that the recognition of their own discourse in Descartes should suit Kim and other 20\textsuperscript{th} century philosophers of mind,\textsuperscript{328} but they receive ample edification from the community of Descartes’ scholars who defend Descartes from the charge of ‘naïve dualist’. This defense ranges from a physiological to an epistemological approach, but in any case, these historians consistently reiterate the basic problem inherited from the philosophy of mind. Let us look at a few examples.

Daniel Garber, whose scholarship informs much of my work in this essay, is not even immune to this tendency. He defines the scope of the problem in writing, “Descartes’ interaction has two aspects: the mental causation of bodily events (volition) and the bodily causation of mental events (sensation and imagination). While both aspects are important, I shall be concerned mainly with the former, mind-body rather than body-mind causation.”\textsuperscript{329} The essays then moves on to give a detailed exegesis of the correspondence with Elisabeth cited above focusing on the possibility of causal interaction. Daisie Radner agrees in her widely cited 1971 essay, “Descartes’ Notion of the Union of Mind and Body”, where she writes, “Descartes seeks to explain the phenomena which make the unity of man plausible, by appealing to the notion of causal influence. In order to explain sense experience Descartes maintains that the body has causal influence upon the mind. In order to explain such phenomena as memory, imagination and

\textsuperscript{327} Ryle, Gilbert. \textit{The Concept of Mind}. Barnes and Noble. 1949. p.10
\textsuperscript{328} For example, Nagel, Thomas. “Consciousness and Objective Reality.” In \textit{The Mind Body Problem: A Guide to the Current Debate}. Edited by Warner and Szubka. “The mind-body problem is a natural outgrowth or by-product of the overwhelmingly successful methods of physical science which have driven the scientific revolution of our era since the seventeenth century. That is why the problem received its essential modern formulation from Descartes, who participated in the beginnings of that revolution.” p. 65
voluntary movement, he maintains that the mind has causal influence upon the body.”\textsuperscript{330} And thus the problem of the union is specified: How do mind and body have causal influence on each other? Rozemond’s approach is forged from the same mold. For instance, she introduces the problem in writing,

For Descartes the mind is radically different from the body – it is an incorporeal thinking thing. One of the most frequently raised questions about this view is: how can mind and body interact if they differ in this way? This question has troubled numerous philosophers, and Descartes himself addressed it on several occasions.\textsuperscript{331}

These of course are some of the essays that devote a paragraph laying out the problem at all, as we could find many that do not.\textsuperscript{332} But it does seem that everyone knows what the mind-body problem is: It is the problem of how the mind effects the body and how the body effects the mind in a fully formed human being. We know that Descartes is a key player in the history of this debate because there is textual evidence for the fact that he addressed the problem and articulated it himself. This leaves philosophers to then solve the problem, perhaps drawing on Descartes, in any number of inventive ways.

It is important to remember that the words ‘mind-body problem’ never appear in Descartes’ published work, his unpublished work or his correspondence. Presumably, we would have to explain what this term means if we were to confront Descartes with the issue. Since the term is not native to his work, we have to admit some imposition on the part of philosophers of history insofar as they import this term. But really what this overview of the 20\textsuperscript{th} century philosophy of mind and Descartes’ scholarship shows us is more than the imposition of a

\textsuperscript{332} This seems to be a tendency of the most recent crop of articles. For instance, one article begins simply by citing Gassendi’s Objection, “how can the soul move the body if it is in no way material, and how can it receive the form of corporeal objects?” to which the author immediately launches into an epistemological solution.
shorthand term onto Descartes’ oeuvre. What we find is Descartes scholars taking up the questions and problems of the philosophy of mind and using that framework to guide their historical inquiries. It is a form of historical research that prizes the recognition of problems in past events and texts above all else. Once we recognize the problem of interaction in Descartes’ work, he conforms to our contemporary discourse, and we can go on to use his work to formulate ‘solutions’ or cast him as a villain whose approach will never lead to a solution. This method repeats the same objects and values in play in the 20th century discourse, and the historian’s job, implicitly, is a rediscovery of Fiegl’s mind-body problem in Descartes. Unsurprisingly, this rediscovery repeats the same objects and values in that it investigates how brain states effect consciousness, and this in a fully-formed adult being, usually ignoring the problems of how the fetus inherits the mind in the process of generation. This approach leaves us to place Descartes in one or the other pre-fabricated categories.

In this way, it certainly seems that the present precedes the past, so much so that often history is entirely eclipsed by contemporary discourse. The 20th century mind-body problem works through several categories of solutions such as those described by Feigl, and attempts to fit Descartes into one or the other of these categories. This imposition is most blatant when we leave solutions aside and consider the problem. Aside from the introductory paragraphs I cited above, there is little to no consideration of the problem itself in the context of the 17th century. It is as if the problem of interaction has stood for all eternity, as if the problem was given ready-made, waiting to be stamped out by the correct solution. It is as if the problem were no more than a lacuna in our knowledge, to be filled in and smoothed over by an ever-improving neuroscience that will someday reveal the solution. According to this prejudice, there is no need to tarry with the problem because the problem is no more than a ghost that will soon disappear. Philosophical
thinking must begin and end with solutions, and specifically with the assertion of the ‘true solution’ and the unmasking of other thinker’s ‘false solutions’. As Gilles Deleuze reminds us, this kind of thinking is a sort of return to grade school, wherein, “the master sets a problem, our task is to solve it, and the result is accredited true or false by a powerful authority […] As if we would no longer remain slaves so long as we do not control the problems themselves, so long as we do not possess a right to problems, to a participation in and management of problems.”

And yet this is precisely the situation we are expected to promote: accept the problem as a problem of interaction between mind and brain, locate the problem in Descartes’ oeuvre, and investigate his work to find a solution.

The Philosophical Preminence of the Problem Over the Solution

What is forgotten in all of this is the importance of the problem itself for science and history alike. As Furet has written, it is not the facts that are most important to history, but rather the problem. The formulation of the problem delineates a field of possible solutions, or facts, according to the formulation of the problem certain obscure facts are uncovered and become salient. This is precisely what has occurred with Descartes’ correspondence with Princess Elisabeth of Bohemia: this is where the solutions lie to a problem formulated most poignantly in the 20th century. Yet what is always forgotten in the incessant interpretation of these letters is that their relevancy as a solution is conditioned by the problem itself – a problem that did not come from nowhere. The significance of these and other passages cited in Descartes’ work is,

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like any proposition, grounded in the problem it is designed to solve. In this case, it is the problem of interaction as it is formulated by the above cited authors.\footnote{\textit{A proposition by itself is particular, and represents a determinate response. A series of propositions can be distributed in such a way that the response they represent can constitute a general solution (as in the case of the values of an algebraic equation). But precisely, propositions, whether general or particular, find their sense only in the subjacent problem which inspires them."} Ibid, 162.}

Insofar as problems generate and condition a field of possible solutions, the formulation of a solution becomes derivative of the formulation of a problem. The problem is, in this sense, philosophically more fundamental than the solutions it may receive. This is why in a certain philosophical tradition including Deleuze, Canguilhem, Furet, Bachelard, Foucault, Bergson and others, we are always reading books about the history of problems and their formulation. Perhaps this is why Feigl’s essay is seen as a classic in the 20\textsuperscript{th} century literature, for he does go to great lengths to formulate the nature of the problem. It is easy to see what side of Bergson’s dichotomy Feigl would fall on, when Bergson defines the work of the philosopher in writing,

\begin{quote}
I consider an amateur in philosophy the one who accepts the terms of an ordinary problem as they come, and holds the problem as definitively posed, merely choosing apparent solutions which necessarily preexist his choice. This is how Butler rejects Darwin’s solution in favour of Lamark’s. But philosophizing for real should mean at once creating the position of the problem and creating the solution […] I consider an amateur the one who chooses between ready-made solutions, as one decides to register as a member of this or that political party [a dualist, a naturalist, a materialist, a behaviorist, a functionalist etc.] But I consider a philosopher the one who creates the necessarily unique solution to a problem which he has posed anew by the very effort to solve it.\footnote{Bergson, Henri. \textit{Melanges.} PUF: Paris. 1972. p. 1528. Cited in During, Elie. \textit{“A History of Problems: Bergson and the French Epistemological Tradition.”} Journal of the British Society for Phenomenology, vol.35, n°1, January 2004.}
\end{quote}

That is, rather than this obsession with problem-solving that is the hallmark of the mind-body discourse, the proper philosophical task is problem-making. When we prioritize solution, we often forget the problem and in so doing, taking up a supposedly ready-made problem and

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impose it on history. In this process, certain texts, passages, and correspondence are brought to the fore, but at the expense of many other historical facts.

The Legacy of the Problem After Descartes

But if the problem is not given ready-made, where does it come from? Again, Feigl’s work is exemplary. It is rooted in a fundamental experience of my being as both conscious and corporeal, and yet unified. These experiences consistently arise in what is traditionally counted as Descartes’ answer to the mind-body problem, and Feigl insists on the experience of introspection wherein we describe elements and aspects of direct experience as the ground of the problem. These experiences such as a pain in my chest or ringing in my ear cannot be described in an objective, third person manner such as when I examine my physical body. For instance, a doctor can measure my eyesight through an eye exam, but when I report my experience of reading the fine print, I report this on the basis of an introspective experience. And from the seeming incorrigibility of the physical eye to the experience of vision, the basic problem is born: “[H]ow are the raw feels related to the behavioral (neurophysiological) states? Or, if we prefer the formal mode of speech to the material mode, what are the logical relations of raw-feel talk (phenomenal terms, if not phenomenal language) to the terms and statements I the language of behavior (or of neurophysiology)?” Far from being given, or existing since eternity, it is this pre-scientific, pre-theoretical experience that gives birth to the mind-body problem. In spite of the complexity of the solutions, the problem itself is posed in the realm of lay people: how do the objective, physical states of the body give rise to certain feelings in consciousness?

It is this fundamental experience that drives the entire discourse throughout, including Princess of Elisabeth’s famous queries,\(^ {337}\) as well as the partial list of scholars investigating Descartes’ work for an answer. It is this experience outlined by Feigl that motivates the problem, which then delineates a certain field of possible solutions. However, once the problem is located in experience and articulated, the discourse is far from determined indefinitely. We can always return to the fundamental experience to ask new questions, formulate new problems, and thereby open the possibility for new solutions. But this is just within the idiom of a single general experience. There are other experiences that give rise to other problems surrounding the union of mind and body. The experience of ancestry, origins, and inheritance are without doubt fundamental to the theory we have been investigating throughout this essay. In Descartes’ work, this experience seems to terminate in a problem different from Feigl’s – the problem of how the soul comes to love the body.

Just as the traditionally stated mind-body problem has its own roots in Descartes’ writing, its own history, and its own contemporary scientific analysis, so too does the problem we have been investigating here. Without question I have shown how the problem has a significant place in Descartes’ oeuvre, but it is important to recognize that the problem did not disappear after Descartes. Although it has no doubt been superseded by an avalanche of theorizing about the problem of interaction, there is nevertheless an important discussion that takes place throughout the 18\(^{th}\) and 19\(^{th}\) centuries surrounding the problem of the origins and unity of mind and body.

Perhaps no historian has better understood this than Eric Voegelin, who in his writings in the early 1930s states that a theory of the origins of mind and body as well as their union is common to all race theorists of the modern period. His *Race and State* and *The History of the Race Idea*, along with other essays, take their starting point with the premise that “the race

\(^ {337}\) AT III, 685
problem is part of the body soul problem; the former requires for its adequate understanding complete clarity about the latter and therefore about the nature of man.” The problem we have been investigating in Descartes’ writing, which has been superceded and obscured by the problem of interaction, finds its place in two centuries of theorizing about the races. Voegelin makes it his point to illustrate this through an investigation of the body-soul-spirit relationship in Buffon, Kant, Gobineau, Klemm and others. In this sense, his work inspires my analysis of Descartes insofar as he illustrates the question of race insofar as it is rooted in a particular theory of how the soul, like the body, is transmitted along bloodlines thereby taking on characteristics peculiar to each race.

Just as the problem of interaction is rooted in a fundamental experience of corresponding bodily and conscious states, so too is the problem of origins we have been investigating all along. Nowhere is this experience more clearly articulated than in the race theorists of the 18th and 19th century. The need for a methodological explanation of how the mind relates to our ancestral bloodlines arises out of the experience that human beings are a kind of mind-body unity, however that unity might be achieved. In our lived experience, we are not two separate spheres, a mind and body, but rather these two sides are fused in a single unit, constituting the integral being. Our selves, as a unified self, exists through an integrated style of actions, means of communicating, corporeal features, and even body language. These aspects of our identity are similar to those around us, most notably our parents who share not only our physical features but also our customs, habits, and demeanor. This particular relationship to our ancestors is broadened to a greater group, namely the races, that seem to have bodies, customs, and demeanors unique to each and to which we seem to share in. Although we are singular units of mind and body, we

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nevertheless seem to inherit certain features common to one or more of the races, and through the last several centuries we have come to define ourselves according to our membership in these groups.

This experience, not entirely absent in Descartes’ writing, is what Voegelin calls “the race experience.” It is not necessarily something that everyone has as it depends upon our historical and societal situation. This is not at all to say that Descartes writes on the basis of the race experience, but it is without doubt that this fundamental experience of an ancestrally determined mind and body was just as significant to him as was the experience of interaction. The whole of Chapter 3 is testimony to this. We know that Descartes experiences a kinship to his ancestry, but this ancestry is not conceived racially but rather theologically: he is concerned in the Third Meditation with how the soul bears the mark of God. The race experience is absent here because Descartes does not define himself or inquire into himself on the basis of his relation to other races, but rather as he relates to God. However, because the mind is inherited from God equally in all, the essence of human being, the ‘I’ is univocal, and there are no comparisons or contrasts to be made regarding the essence of human being. We saw how this was crucial to Poullain de la Barre’s feminism.

Today the individual’s existence is not determined by his or her relationship to God, but rather by our status as a member of a particular community determined on the basis of descent, or ‘bloodlines’, which hold sway over both mind and body. No thinker has better understood the problem of mind and body in this light better than Francis Galton who in the 1860’s and 1870’s tried to methodologically explain the generation of the mind in the parents and thereby prove that there are racially distinct soul-characteristics determined through racial ancestry. In his works, Galton set out to show that mental qualities were inherited and subject to the same laws of
natural selection that Darwin had recently laid out in the *Origin of Species*.\(^{339}\) The fundamental belief underlying Galton’s entire eugenic program is that “our natural constitution seems to bear as direct and stringent a relation to that of our forefathers as any other physical effect does to its case. Our bodies, minds, and capabilities of development have been derived from them. Everything we possess at birth is a heritage from our ancestors.”\(^{340}\) Throughout his work, Galton’s aim is to demonstrate the biological inheritance of mental capacities, which he recognizes as a separate, but related, problem to how physical characteristics are transmitted.\(^{341}\) Nevertheless, he presumes that mental and physical qualities alike are transmitted biologically, and insights into one will provide insights into the other.

This problem of how the mind is inherited like the body harkens back to the problem of eduction that we discussed in the First Chapter. Suarez, along with Descartes, deny this possibility, attributing the mind to God’s infinite creative power. Galton does not invoke God, and instead he turns to a theory of race based on anecdotal evidence to buttress his claim. In Galton’s work, the term ‘race’ is synonymous with the hereditary transmission of mental traits. As he explains in an 1873 article called *Hereditary Improvement*, the condition of our bodies and minds are in part under the control of our voluntary actions. Beyond this, two influences out of our control come to shape our psychic and physical life: 1) “the constitutional peculiarities

\(^{339}\) Darwin also thought that the mind was subject to the laws of ‘The Preservation of the Favoured Races in the Struggle for Life’, ending the Origin of Species by writing: “In the distant future I see open fields for far more important researches. Psychology will be based on a new foundation, that of necessary acquirement of each mental power and capacity by gradation. Light will be thrown on the origin of man and his history.” Darwin, Charles. On The Origin of Species. In From So Simple a Beginning: The Four Great Books of Charles Darwin. Edited by E.O Wilson. W.W. Norton: New York. 2006. p. 759.


\(^{341}\) “In investigating the hereditary transmission of talent, we must ever bear in mind our ignorance of the laws which govern the inheritance of physical features. We know to a certainty that the latter exist, though we do not thoroughly understand their action.” Galton, Francis. “Hereditary Talent and Character” *Macmillan's Magazine*, vol. 12, 1865 p. 157
transmitted to him by inheritance,” and 2) “the various circumstances to which he has been
perforce subjected, especially in early life.”

He intends to deal with the influences of the first,
which he calls “race,” leaving aside aspects under our control, or “nurture.”

His position on
these influences is clear: “I look upon race as far more important than nurture. Race has a double
effect, it creates better and more intelligent individuals, and these become more competent than
their predecessors to make laws and customs, whose effects shall favourably react on their own
health and on the nurture of their children.”

Furthermore, Galton is always sure to deny
Descartes’ position on the matter, leaving God no role in the transmission of the mind. He refutes
everything we have learned from Descartes in last three chapters of this essay writing, “Most
persons seem to have a vague idea that a new element, specially fashioned in heaven, and not
transmitted by simple descent, is introduced into the body of every newly-born infant. Such a
notion is unfitted to stand upon any scientific basis with which we are acquainted.”

Of course, Galton has a famously difficult time proving this. Leaving his failed experiments in Pangenesis
aside, his strongest and most coherent arguments come in the form of empirical observations of
the races. That Galton’s investigation of race is nothing other than an inquiry into how
“hereditary influence is as clearly marked in mental aptitudes as in general intellectual power”
is amply clear in Galton’s comparisons of the races. He begins with the fundamental experience,
noted by Voegelin above, that each of the races reproduce their own kind, and in so doing they
perpetuate not only a certain body type, but also a peculiar “character and intellect.”

This is most clear, Galton believes, in the American Indians who exhibit a uniformly docile, taciturn,

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343 Ibid
344 Ibid
1865), pp. 318-327 p. 322
346 Ibid 320
347 Ibid
and melancholic temperament. This mental disposition stands in starkest contrast to the African
who is warm-hearted, gregarious, prolific, lacking dignity, lacking reticence, and without
patience. Both races are similar in that both are incapable of progress, remaining forever
children in mind. For Galton this evidence of distinct but uniform mental aptitudes and
intellectual dispositions throughout peoples related through bloodlines can only be explained by
a mind that is determined ‘racially’ in Galton’s strict sense of the word.

It is not certain that thinkers such as Sydney Shoemaker recognize the extent to which
their problem overlaps with Galton’s. For instance, when Shoemaker writes of the mind-body
problem, “More generally, it is the problem of how distinctive features of the mental –
intentionality, consciousness, subjectivity, etc. – can have a place in a naturalistic worldview
which sees the mind as a product of biological evolution and as having a physic-chemical
substrate in just the way other biological phenomena do,” it certainly seems to be a color-blind
formulation of Galton’s question as to how “The Mongolians, Jews, Negroes, Gipsies, and
American Indians severally propagate their kinds and each kind differs in character and intellect,
as well as in colour and shape, from the other four.” This is the knot that Suarez, Fernel, and
Descartes all avoided by invoking God as the creator of our essence. Of course, this only created
other problems for Descartes, a problem that we have seen is just a deeply rooted in the theory of
generation as is Galton’s problem. In this sense, the fundamental role of generation is constant
in the mind-body problem, but when the importance of our relationship to God is trumped by our
relationship to other races, the problem changes. It becomes a race question rather than a

348 Ibid 321
349 Ibid 326
theological question, as Voegelin knew well. How this transition occurred and who the key figures are in that history is crucial work still to be done by mind-body and race historians alike.

Conclusion

At this point the problems begin to multiply. First, regarding the origins of the mind, body, and their union, God plays a central role in Descartes’ conception of the human being as ‘one single thing’. God is the immediate cause of the soul as He also maintains the dispositions of the body that the soul comes to love. In this sense, Descartes’ mind-body problem is essentially rooted in Christianity. If we were to ask Nagel’s question of how the mind ‘fits’ in the natural order, we must recognize that ‘mind’ has not always been ‘natural’ in the sense that it is produced and perishes like an organic body. In Descartes thought, the mind is supernatural in its origin and it does not perish with the body. Descartes’ problem, the problem of how two ancestries converge in my being, is not our problem today. Our problem is one of eduction, if it is permissible to use such an anachronistic word. God does not produce the soul; today we believe, or even know, it is the product of evolution, which is to say that the mind is inherited along bloodlines. How that occurs is a fundamentally different problem from Descartes’ problem of love. In accepting the premise that the mind is educed from our parental ancestors, philosophers must also accept that Descartes’ mind-body problem is not identical to our problem. Our problem is just how the mind evolved and if it has any status over and above matter. But Descartes, in presuming separate ancestries for mind and body, is faced with a radically different problem. It is so radical that Descartes simply cannot be seen as a precursor or originator of our mind-body problem. Our mind-body problem begins only once the human
sciences assume an educated or evolved soul. Of course, in a sense, this is our problem, since my dissertation is still a long way from discovery when this problem began and the specifics of its formulation.

However, the discovery that the mind-body problem is so broad and that the question can be approached from perspectives outside neuroscience is a positive result of this dissertation. Though only in a cursory way, in this chapter I have sketched the role Suarez’s and Descartes’ thoughts on eduction and production factored into Galton’s race theory. The idea that the origins of the mind is an important concern for a rigorous science of race comes as no surprise to race theorists such as Voegelin or Galton, but this nexus is not commonly acknowledged by philosophers of mind who continue to publish on mind-brain science. I do not deny that the popular discourse concerning the relation between mind and brain are important to the problem, but that by no means exhausts the problem. As we have seen, history proves this. Fernel, Harvey, Descartes and others demonstrate the enormity of the problem and at times even the peripheral role that mind and brain play in its formulation. This dissertation has focused on one figure, Descartes, and just one aspect of the problem in his work, generation. But this is an important aspect that receives far too little attention from mind-body scholars and our contemporary race theorists. Voegelin has gone the farthest in detailing the relations of mind-body theory, generation, and race in his Race and State and History of the Race Idea. Nevertheless, with a sincere appreciation of Voegelin’s efforts, it must be said that a rigorous history of this nexus remains to be written. Whether or not this history is written is interesting as it bears on the answer to several important questions: Will the narrow obsession over intentionality and brain states in a fully-formed human being open its doors to other aspects of the mind-body problem, particularly those concerning race and gender? Relatedly, will philosophy continue to discover
and clarify the important thinkers in the history of the mind-body problem such as Jean Fernel and Francis Galton? Which thinker or thinkers first scientifically establish our contemporary assumption of a biologically evolved mind generated part and parcel to the body? Is this idea as old as the Haller-Wolff debate as Voegelin suggests? Or did it begin with Kant’s science of race? Or was it the work of Darwin? Without knowing where or when our mind-body problem begins, a problem different from Descartes’, it is hard to know what other aspects of the problem we might be completely unaware of.
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