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**MENTAL ACTIVITY IN DESCARTES'
CAUSAL-SEMANTIC MODEL
OF SENSORY PERCEPTION**

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DECLARATION

I hereby declare that this thesis has been composed entirely by myself and that it has not been submitted, in whole or in part, in any previous application for a degree. Except where stated otherwise by reference, quotation, or acknowledgment, the work presented is entirely my own.

Signed

29th September 2017

ABSTRACT

The aim of this thesis is to defend a reading of Descartes' theory of sensory perception in which, against a widespread interpretation, the mind is not a passive receiver of inputs from the environment, but an active decoder of neural information that contributes to the representational content of ideas. I call this the 'mental activity thesis' and, in the overall picture, I identify it as one of the philosophical implications of the seventeenth-century scientific revolution.

Within Descartes' dualism, to offer a theory of sensory perception amounts to describing the interplay between the natural world, the brain, and the mind. Given his mechanistic, micro-corporeality conception of matter, Descartes developed detailed physiological descriptions of the interaction between external objects and the brain. He envisaged it as an isomorphic relation in which the characteristics of objects are transmitted through the nerves to the brain as patterns of geometrically reduced properties. This process is often read as culminating with the mind being passively affected by a corporeal isomorph. Descartes' doctrine becomes elusive in its mental phase, but the passivity reading, so I contend, remains inadequate. I argue for the mental activity thesis through four claims.

First, I subscribe the known view that Descartes is concerned about a version of the mind-body problem that is not equivalent to the problem of substance interaction. It is rather a problem of dissimilarity between mental representations and mechanistic explanations. The question is how the qualitative character of sensory experiences can arise from the quantitative notions of physical science. As a way of emphasising the weight that the problem of dissimilarity has for Descartes' philosophical decisions, I show that it motivates a metaphysically interesting distinction between types of causes for the case of brain-mind interaction.

Second, I defend the position that, despite not holding a perfectly unambiguous doctrine, Descartes' introduction of natural signs is the closest that he got to formulating a full-fledged theory of sensory perception. The appeal to natural signs has been normally deemed as metaphorical in the literature. I argue that, on the contrary, it is possible to reconstruct a causal story for brain-mind interaction along the lines of a semantic model based on Descartes' identification of neural events with natural signs. A causal-semantic model emerges as a charitable, plausible reading that reveals the mind as an active interpreter.

Third, in light of the mental activity thesis, I read Descartes' late appeal to the innateness of all ideas (notably in the *Comments on a Certain Broadsheet*) as a strategy to account for a type of representational content needed for sensory ideas that, while produced by the mind, is different from that of his paradigmatic innate ideas. I assist Descartes in exploring how the category of innateness captures mental activity within a causal-semantic theory.

Fourth, in the course of this argumentation, and for further support, I address the role of the distinction between primary and secondary qualities in Descartes' theory. I tackle a pervasive objection stemming from his alleged association of the perception of primary qualities with the intellect. By reassessing Descartes' views on mental activity, this interpretation aims at a lucid description of sensory perception that goes beyond the rigid rationalism that is often credited to him.

KEY WORDS: Descartes, sensory perception, dissimilarity, natural signs, mental activity, universal innateness, primary and secondary qualities

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REFERENCES TO DESCARTES' WORKS

For each reference, the original language one is given first, followed by an English translation. They are given in brackets and separated by a slash (/). Editions and abbreviations are the following:

- AT The original language text of the writings of Descartes is the Adam and Tannery edition. It is abbreviated 'AT', followed by the volume number and the page number.
- CSM The English translations of the writings of Descartes is the Cottingham, Stoothoff, and Murdoch edition (1993). It is abbreviated 'CSM', followed by the volume number and the page number. *
- G For the English translations of *The World* (including the *Treatise on Light* and the *Treatise on Man*), the reference is to S. Gaukroger's translation (1998). It is abbreviated 'G', followed by the page number.
- S For the Correspondence between Descartes and Elizabeth of Bohemia, reference is to L. Shapiro's translation (2007). It is abbreviated 'S', followed by the page number.
- CSMK For the rest of Descartes' correspondence, the reference is to the Cottingham, Stoothoff, Murdoch, and Kenny edition. It is abbreviated 'CSMK', followed by the volume number and the page number.

* For the *Principles of Philosophy*, the reference also includes the book number and the article number specified in the original Latin edition.

For the *Passions of the Soul*, the reference also includes the book number and the article number specified in the original French edition.

REFERENCES TO DESCARTES' WORKS

The following abbreviations are used in references:

R	Rules for the Direction of the Mind (1628)
TL	Treatise on Light (1629-33)
TM	Treatise on Man (1629-33)
DM	Discourse on the Method (1637)
Op	Optics (1637)
Mt	Meteorology (1637)
MM	Meditations on First Philosophy (1642)
Pr	Principles of Philosophy (1644)
CB	Comments on a Certain Broadsheet (1647)
DHB	Description of the Human Body (1647)
PS	Passions of the Soul (1649)

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INTRODUCTION

Philosophy is written in this grand book, the universe, which stands continually open to our gaze

— Galileo, *The Assayer*

Early modern theories of sensory perception are shaped by a remarkable confluence between science and philosophy at the rise of the seventeenth-century scientific revolution. In line with the division of disciplines at the time, we can say that Descartes' views on sensory perception are the product of an understanding of natural philosophy as an experimental mathematical science, together with a progressive renovation of the metaphysical map of reality. The general aim of this dissertation is to put forward a reading of Descartes' theory that lives up to this integrative challenge.

Mechanism was at the core of the new scientific and philosophical image of the natural world emerging in seventeenth-century Europe. Although the mechanistic standpoint allowed for a variety of scientific theories, its pre-Newtonian version is generally defined as the view that all natural phenomena can be explained by appealing to a small range of quantifiable characteristics of micro-particles of homogeneous matter. In the Cartesian theory, these features are the shape, size, and motion of micro-corpuscles. Certainly, the methods and discoveries of the seventeenth-century scientific revolution shaped decisively the development of science, but the revolution was more than an especially prolific time for material innovation. Descartes' natural philosophy allows us to see that a fundamental aspect of this paradigm shift was, in fact, a change in the nature of explanation. Descartes' constitutes an exemplary case of this change due to his emphatic rejection of the metaphysical assumptions of Aristotelian-inspired natural philosophy. A new science needed a new conceptual framework and (following the tree analogy from the preface to the French edition of the *Principles*), Descartes was set to ensure the fruitfulness of the new natural philosophy by means of the solid roots of indubitable metaphysics (AT IXB 15/CSM I 186).

In this context, an explanation of sensory perception constituted a particularly intricate challenge. A mechanistic image of nature opened a gap between appearance and reality that rendered the senses inadequate sources for achieving truths about the world. For a rationalist like Descartes, the new theory of matter showed with special force that the ontologically loaded empiricism of his Scholastic teachers had to be overturned. According to a standard version of the Aristotelian-Scholastic doctrine of sensory perception that Descartes explicitly opposed, we have the senses that we do precisely *because* they are suited for truthful perception. This teleological stance (that preserved similarity between objects and ideas) generated an account of perception that required the actual transmission of a ‘form’, without ‘matter’, of the object to the perceiver’s mind. Generally speaking, Descartes and other natural philosophers at the time were set to change the direction of fit of such accounts —dissimilarity between objects and ideas was a fact, and a theory of perception had to be built upon it.

Within Descartes’ dualism, sensory perception is equivalent to the interplay between the natural world, the brain, and the mind. His detailed mechanistic physiology accounted for the transmission of sensory information between external objects and the brain. It was depicted as an isomorphic relation in which the characteristics of objects are transmitted through the nerves as the motion patterns of its geometrically reduced properties. This process is often read as culminating with the mind being passively affected by the isomorphic (or structural) representation formed in the brain. It cannot be denied that Descartes’ doctrine becomes elusive in its mental phase, but the passivity reading, so I contend, remains inadequate. The objective of this dissertation is to defend a reading of Descartes’ theory of sensory perception in which, against a widespread interpretation, the mind is not a passive receiver of inputs from the environment, but an active decoder of neural information that contributes to the representational content of ideas. This reconstruction of the process of sensory perception receives the name of ‘causal-semantic model’. Additionally, I identify a specific concern, labelled by Rozemond (1999) as the ‘problem of dissimilarity’, as the dominant motivation for Descartes’ theory. An outline of this problem is as follows.

Descartes begins *The World*—his most ambitious systematic work concerning the principles of his mechanistic micro-corpiscularianism—with a straightforward statement about sensory

perception. He writes: ‘the first thing that I want to draw to your attention is that it is possible for there to be a difference between the sensation that we have, that is, the idea that we form of it in our imagination through the intermediary of our eyes, and what it is in the objects that produces the sensation in us’ (AT XI 3/G 3). This statement is at the core of Descartes’ views on sensation and it poses a problem that, I suggest, determined his whole theory. This is the ‘problem of dissimilarity’ (PD), which constitutes the refined version of the mind-body problem that Descartes was concerned about. Note that the (PD) is not equivalent to the alleged problem of interaction between finite substances and that, in contemporary terms, it amounts to the question of how the qualitative character of sensory experience can arise from the quantitative notions of physical science.

For Descartes, the (PD) highlights a causal fact. Namely, the representational content of sensory ideas cannot be identified, in any intelligible way, with their corresponding brain states, and therefore, it cannot arise from them. As a solution for this complexity, Descartes seems to consider, in many occasions and in different ways, that the mind actively supplies the representational content of sensory ideas. The thesis that the mind has a substantial role in the way in which we perceive the world has not been traditionally attributed to Descartes. Rather, he is typically associated with an unrefined substance dualism that is accompanied by a passivity reading of sensory perception. In this regard, many authors within the diverse contemporary Cartesian scholarship have challenged certain recalcitrant inadequate readings of Descartes’ philosophy. However, the mental activity thesis is still often resisted, with the notable exceptions of the (widely different) proposals by Schmaltz (1997), Rozemond (1999), Simmons (2003), Machamer and McGuire (2009), and Chignell (2009). While relying on some of their insights, I also pursue different lines of argument that I outline in the upcoming overview.

OVERVIEW

In CHAPTER ONE, I subscribe the known view that Descartes is concerned about a refined version of the mind-body problem that is not equivalent to the problem of interaction between finite substances. It is rather a problem of dissimilarity between the representational content of sensory ideas and the physical causes of those ideas. The (PD), I suggest, motivates

a metaphysically interesting distinction between the types of causes that operate in the interaction between brain and mind in sensory perception. An analysis of Descartes' choice of terminology for depicting brain-mind interaction will reveal a consistent and carefully established balance between the denial of efficient causation and the appeal to genuine causal powers. This analysis constitutes simply the first step in ruling out interpretations of Descartes' doctrine of sensation which either hold that brain-mind interaction is a non-causal transaction; or which explain brain-mind interaction by resorting to causal powers that cannot emanate, to some extent, from the human brain and the human mind.

In CHAPTER TWO, I supply the content for the theoretical frame created in Chapter One. That is to say, I reconstruct a model for sensory perception that includes a causal transaction that, while being equally genuine, is not of the same type as the efficient causes operating amongst bodies. I contend that, despite not offering a perfectly unambiguous doctrine, Descartes' identification of brain states with 'natural signs' (AT XI 4/G 4) constitutes his most refined attempt at an alternative causation model, as well as the closest that he got to formulating a fully-fledged theory of sensory perception. This alternative model has received the name of 'semantic' as well as 'causal-semantic' (Marion 1981, Yolton 1984, 2000, Gaukroger 2002, Chignell 2009). I shall use only the latter formulation, since it highlights the notion that a semantic relation is *also* a proper causal relation. In the Cartesian context, a causal-semantic model integrates the whole process of sensory perception in a triadic relation between the external object, the brain, and the mind. Within Descartes' mechanistic physiology, a motion pattern of the geometrically reduced properties of external objects is transmitted through the nerves to the internal cavities of the brain, where a structural representation of it is formed. In a causal-semantic model, this structural representation has the role of a sign that, by virtue of its being instituted by nature, *signifies* the external object *to* the mind. As a result, the mind acts as a decoder of natural semantic correlations between brain states and external objects. The result of this decoding activity is an idea of the external object, the representational content of which counts as a product of the mind's own causal efficacy. The argumentation in favour of this reading of Descartes' views on sensation proceeds in three stages:

- (1) In the first stage I reconstruct Descartes' taxonomy of signs. It is important, for justifying the plausibility of a causal-semantic model, that Descartes employed a stable notion of 'sign' for explaining two other phenomena aside from sensory perception. He introduced the category of 'external signs' for explaining the external movements of the passions (PS XI 411/CSM I 367), and the category of 'conventional signs' for developing his theory of language (DM AT 56/CSM I 139). A stable taxonomy of signs will show that a semantic narrative is not foreign to Descartes' thought. In turn, this conclusion will counter claims about natural signs being a one-off figure of speech, and about the causal-semantic model being over-speculative.

- (2) Then, as a second stage, I offer an interpretation of the textual occurrences of natural signs throughout Descartes' works as well as a brief study of the philosophical precedents of a causal-semantic model. I identify the late Scholastic distinction between 'formal' and 'instrumental' signs as a vital component of Descartes' way of thinking about semantic relations. In particular, the notion of a formal sign assists in the task of accounting for the type of pre-cognitive interpretative activity carried out by the mind in sensory perception.

- (3) Finally, in the third stage, I complete the characterisation of a causal-semantic model by putting forward one explanatory advantage that has been called 'Qualified Explanatory Naturalism' (QEN). This part of the argumentation follows closely the contribution of Chignell (2009) to the debate. (QEN) refers to a methodological approach that is in line with Descartes' goals as a rationalist natural philosopher, and it is defined as the policy of not resorting to supernaturalistic solutions until naturalistic explanations have been exhausted. Amongst the main rival causal theories, the causal-semantic model emerges as the one that provides a causal story for brain-mind interaction that is as much of a naturalistic explanation as it can be. This means that, in doing so, it postpones the inevitable final appeal to God's ordination as much as possible.

After presenting the causal-semantic model, I turn my attention in CHAPTER THREE to an aspect of Descartes' thought that is entangled with any interpretative proposal (causal-

semantic or of any other type) whereby the mind is not a passive receiver of sensory inputs. This aspect is the thesis that *all* ideas are innate, and it appears notably in the *Comments on a Certain Broadsheet*, although it is also foreshadowed in other texts. In the literature, this thesis is commonly labelled as ‘hyper-nativism’ or ‘universal innateness’. Hyper-nativist statements come across in the Cartesian texts as a way of dealing with the (PD). In a nutshell, the reasoning seems to be that, since the representational content of sensory ideas cannot be identified with its physical causes, and cannot be produced directly by them, it must be produced innately. Thus, an active role for the mind in sensory perception appears again — in this case under the designation of innateness.

On the face of it, this is an immediately problematic addition to the Cartesian theory of ideas for a number of reasons. First, hyper-nativism is at odds with the sharp and seemingly authoritative classification of ideas laid out in the *Meditations* (between adventitious, factitious, and innate ideas, AT VII 37-8/CSM II 26). Under the lens of this classification, innate ideas include only our ideas of God, of eternal truths, and of fundamental logical axioms (*i.e.* ‘simple natures’). Second (and closely connected), hyper-nativism clashes with Descartes’ fundamental claim that sensory ideas come somewhat passively from external objects and thus also conflicts, overall, with his proof for the existence of body. In Descartes’ thought, this amounts to a rather formidable tension. Namely, if sensory ideas are not caused by external objects (as they seem to be), the critical point about the benevolent, all-powerful nature of God is compromised. He expresses this with clarity in the well-known passage of Meditation Six: ‘I do not see how God could be understood to be anything but a deceiver if the ideas were transmitted from a source other than corporeal things’ (AT VII 80/CSM II 55).

In this chapter I intend to show, first of all, that it is possible for Descartes to hold hyper-nativism while retaining a non-trivial sense in which bodies cause sensory ideas. In doing that I join a group of diverse reconciling responses in the literature (amongst others, Jolley 1990, Schmaltz 1997, Rozemond 1999, Nelson 2008, Boyle 2009). At the same time, I take a slightly different argumentative route, and I emphasise the importance of hyper-nativism for the thesis that the mind is active in sensory perception. This leads to my main point. Namely, as a continuation of the causal-semantic model of sensory perception, hyper-nativism is

Descartes' strategy to account for a type of mental content needed for the production of sensory ideas. While being the product of the mind's own causal efficacy too, this type of mental content is different from that of his paradigmatic innate ideas.

In order to reach this conclusion, I identify a difference between the rationale behind the three-fold classification of ideas in the *Meditations* and the one behind hyper-nativism. Whereas both categorisations are shaped by a causal question about ideas, the question behind them is not the same. Consequently, neither is the result. In brief, on one hand, the classification in the *Meditations* enquires about the causal origin of ideas in the sense of determining the faculty that sets off their production process. The question that underpins Descartes' hyper-nativist claims, on the other hand, seeks the source of the representational content of those ideas. Ultimately, this distinction makes the sufficient theoretical room in Descartes' theory for two types of innate ideas: the purely innate, and the innate yet adventitiously conditioned. The usage of a category of the 'purely innate', I should add, is not to be read as the mark of a hierarchy of 'first-rate' and 'second-rate' innateness. It simply refers to innate ideas that are fully accounted for the faculty of mind that Descartes calls 'pure intellect'. All in all, the hyper-nativist strategy counts as Descartes' formulation of the activity of the mind in sensory perception within his theory of ideas.

In CHAPTER FOUR, I complete the picture of Descartes' thesis of the activity of the mind in sensory perception by shifting the focus of the discussion towards the topic of sensible qualities. Descartes did not employ the terms 'primary' and 'secondary' qualities, but a similar distinction arises from his texts: some sensible qualities of objects (such as size or shape) are intrinsic properties of matter, whereas others are products of the interaction of objects with a perceiver (for example, colour or smell). Throughout the dissertation, I shall use the common terms 'primary' and 'secondary' qualities for convenience, while clarifying their meaning in the Cartesian system. Now, significantly for this project, Descartes' treatment of sensible qualities poses an important textual challenge for a unified theory of sensory perception that is motivated by the (PD) and incorporates the activity of the mind. This complexity runs schematically as follows: Descartes often describes ideas of primary qualities as 'clear and distinct' and ideas of secondary qualities as 'obscure and confused'. The former kind seem to be perceived intellectually, and they appear to represent accurately their causes (that is, the

nature of matter). The latter kind seem to be perceived by the senses, and they are deemed as misrepresentations of the properties of matter. The view that Descartes splits cognition between the clear and distinct intellectual perception of primary qualities and the obscure and confused sensory perception of secondary qualities has been opposed by Simmons (2003), who has named it the ‘bifurcation reading’. I will side with her view in rejecting such a reading.

The problem with this division of labour is that, when we look at the Cartesian theory of sensory perception from the perspective of specific sensible qualities, the (PD) vanishes for the case of primary qualities and, consequently, mental activity does not appear to be required for their perception. As a result, we are left with a theory of sensory perception that, on one hand, exhibits an awkward cognitive fragmentation in the perception of the different qualities that a single specific object possesses. On the other hand, the active role of the mind in sensory perception takes the air of an *ad hoc* solution that is devised *only* for dealing with the perplexing nature of secondary qualities. In order to rule out the bifurcation reading (and its unpromising conclusion for this project), I will offer an argumentation in three steps, for which I will provide ample textual support:

1. First, I clarify that when Descartes’ refers to the ‘obscurity and confusion’ of ideas of secondary qualities he is making a point that goes beyond a standard version of perceptual error. Rather, the terms obscurity and confusion are connected to the misrepresentation of what he calls the ‘true nature of bodies’ at a micro-corpuscular level (Pr I 73, AT VIIIA 37/CSM I 220). Crucially, this misrepresentation happens for both primary and secondary qualities.
2. Second, the instances where Descartes attributes ‘clarity and distinctness’ to ideas of primary qualities refer exclusively to matter considered *abstractly*, and do not bear on cases of specific objects in particular acts of perception. This difference between specific and general characterisations of matter in Descartes relies on an argument by Wilson (1991). The weight of this distinction, I believe, has not been properly emphasised in assessments of the Cartesian theory of perception.

3. Third, I re-examine the rationale behind Descartes' classification of types of sensible qualities, and I determine that it does not concern their similarity or dissimilarity with external causes. In summary, these points yield the conclusion that the (PD) is a phenomenon that is constitutive of the perception of both primary and secondary qualities. The activity of the mind, therefore, remains in a non-fragmented process of sensory perception across the board.

In conclusion, this dissertation pursues a charitable and textually robust interpretation of Descartes' theory of sensory perception in which the mind has a substantial role. In doing so, it aims to revise a specific aspect of the history of ideas. On one hand, it confirms the Cartesian theory as a strong naturalistic view emerging from the seventeenth-century scientific revolution. On the other, and despite Descartes' own uncertainties, it reads his theory of mind as a sophisticated piece both in the progression towards the Kantian shift, as well as in the modern becoming of the discipline of the philosophy of mind.

METHODOLOGICAL REMARKS

Finally, here I sketch the methodological approach taken, and I address some choices in my treatment of the topic.

Use of the texts — My methodology is an examination of the descriptions of sensory perception in the entirety of the Cartesian corpus. As in any project in the history of philosophy, primary sources occupy centre stage. At the same time, I am careful to devote attention to the context of passages and to the aims of specific works. For example, an assessment of Descartes' claims in the *Rules* considers its status as an early work whose epistemological structure is not still permeated by a mature natural philosophy. As a further example, in the case of the *Meditations*, its closed context as a methodological exercise might lead to certain naturalistic explanations being abbreviated. I will add considerations of this sort throughout my textual analyses. Besides, I shall also be wary of not creating, whenever the texts allow it, an artificial division between Descartes' natural philosophy and his metaphysics. I do not think that this

was his objective, and I attempt to preserve, whenever possible, the integrative nature of his system.

Early Modern terminology — Overall, the technical terms that I employ follow Early Modern designations. I will notify the reader whenever I use a homologous contemporary term for the purpose of clarifying an idea, or for establishing a connection with a topic in contemporary philosophy. For clarificatory purposes, I add here two terminological facts about Descartes' writings:

- (1) First, within his dualism, 'mind' and 'soul' are used interchangeably for referring to the thinking substance. I have used the former in line with the name of the discipline at stake, that is, early modern philosophy of mind.
- (2) Second, Descartes employed the terms 'sensory perception', 'sensation', and 'sensory ideas' almost as complete synonyms. One can detect some nuances, such as the use of 'sensation' in more instances concerning ideas of secondary qualities, or in the case of the passions. At any rate, this never amounts to an exclusive association. Finally, it is important to note, as Simmons (2003) has pointed out, that 'sensory perception' and 'sensation' are not equivalent to representational and non-representational mental states respectively. Descartes' texts do not provide evidence for this contemporary reading of the terms.

Choice of topics — This dissertation aims to give an interpretive treatment of the hypothesis that the mind is active in Descartes' causal-semantic model of sensory perception. At the same time, some topics will be inevitably prioritised over others. As I see it, there are two issues that are fundamental to any reading of Descartes' that proposes that the mind is active in sensory perception: on one hand, a reconstruction of a causal model that Descartes *could have* held (I provide it in Chapter Two), on the other, an assessment of Cartesian hyper-nativism (as I present in Chapter Three). A number of points of contention arise from these two issues, including some strong objections regarding internal consistency. Defences of the possibility of mental activity tend to focus on countering a couple of them. The first objection is the passivity reading *i.e.* the view that Descartes considered sensory perception as a passive

reception of inputs from the environment. The second objection is the thesis of the transparency of the mind *i.e.* the view that, for Descartes, the mind is aware of any mental state that it has.

I have incorporated a few claims against these two objections in several sections of the dissertation. At any rate, this dissertation, as whole, is a continuous answer to the passivity reading. I have also chosen to examine in finer detail a different challenge coming from his treatment of sensible qualities. As specified in the overview, this will appear in Chapter Four. The tension between Descartes' alleged distinction of qualities and his depiction of the (PD) has not been often explored in the literature. I believe, however, that it poses a challenge that is more pervasive than the issue of the transparency of the mind mentioned above. I take this interpretative route with the expectation of a more fruitful assessment of the Cartesian theory.

CHAPTER 1

A CAUSAL NARRATIVE FOR SENSORY PERCEPTION

0. INTRODUCTION

Descartes begins *The Treatise on Light* by drawing our attention to one main point concerning sensory perception. Namely, that ‘it is possible for there to be a difference between the sensation that we have of it (light), that is, the idea that we form of it in our imagination through the intermediary of our eyes, and what it is in the objects that produces the sensation in us’ (AT XI 3/G3, clarification added).¹ This thesis regarding dissimilarity between our sensory ideas and their physical causes arises from fundamental aspects of Descartes’ natural philosophy, and it determines to a great extent the causal story for his theory of sensory

¹ The title of the first chapter of the *Treatise on Light* is precisely a general statement of the same thesis: ‘The difference between our sensations and the things that produce them’. In any case, as Gaukroger notes, the chapter headings might have been a later addition by Claude Clerselier for the (posthumous) 1677 edition of *The World* (G3). Descartes abandoned the project of *The World* upon knowing about Galileo’s condemnation by the Holy Office of the Inquisition in 1633. He wrote forthrightly to Mersenne about his frustration and about Galileo’s Copernicanism ‘I was told that it had indeed been published (Galileo’s *Dialogue Concerning Two World Systems*) but that all the copies had immediately been burnt at Rome, and that Galileo had been convicted and fined. I was so astonished at this that I almost decided to burn all my papers or at least to let no one see them. For I could not imagine that he—an Italian and, as I understand, in the good graces of the Pope— could have been made a criminal for any other reason than that he tried, as he no doubt did, to establish that the earth moves (...) I must admit that if the view is false, so too are the entire foundations of my philosophy’ (November 1633, AT III 270-1/CSMK III 40-1, clarification added).

perception.

Within Descartes' dualism, an explanation of sensory perception amounts to elucidating the interplay between an external object, the brain, and the mind. By means of his mechanistic physiology, he elaborated on a complex system of motion correspondences that transmit information in the form of the geometrically reduced properties of objects through the nerves and up to the internal cavities of the brain, where the pineal gland is located. As a result, a structural (or 'isomorphic') representation of the object is formed on the surface of the gland. From there, the process of sensory perception gets more complicated. How do we get from a structural representation in the brain constituted by motion patterns to a sensory idea *as we know it*? Before becoming a puzzle about causation, this scenario poses the problem that Descartes identified in the excerpt from the *Treatise on Light* above. That is to say, there is a seemingly inscrutable dissimilarity between the quantitative nature of physical states (states of objects and brains) and the qualitative character of the mental states that invariably correspond to them in our sensory experience. This is, in a nutshell, what has been called the 'Problem of Dissimilarity' (hereafter referred as PD). This problem has been identified notably by Rozemond (1999) as the refined version of the mind-body problem that Descartes is concerned about.

This chapter starts with an exploration of why Descartes considered the (PD) as a troubling feature of sensory perception. In §1, I offer an overview of the problem against the background of the standard version of Aristotelian-Scholastic natural philosophy that Descartes was reacting to. First, I outline his motivations for putting forth a new theory of sensory perception that rejects the ontological underpinnings of some of the Scholastics. Second, I sharpen the characterisation of the (PD) as a product of Descartes' micro-corpuscularian mechanism. I contrast it with the alleged problem of interaction between the finite substances (mind and body), which is the worry that is commonly associated with Cartesian dualism. This section is mainly explanatory and it sets the stage for the reading of Descartes' theory of sensory perception that I will develop throughout this dissertation. In §2 I examine Descartes' descriptions of the interaction between brain and mind in sensory perception. This textual analysis will be a platform for the rest of the chapters of the dissertation. The purpose of the textual analysis is to show that there is in Descartes a manifest effort to elucidate how the

interaction between brain and mind happens, as well as to ground it on the powers and dispositions of the human brain and mind. More specifically, I will concentrate on the claim that Descartes indisputably conceived of the interaction between brain and mind in causal terms, and that instead of leading him towards several sorts of dualist predicaments, his claims and intuitions point to a metaphysically interesting distinction between types of causes. This means that this section will (at least partly) counter readings of Descartes' theory that consider that the (PD) forces him to endorse a non-causal model of sensory perception, *i.e.* a model in which external objects (and the brain, by proxy) cause sensory ideas in either a very minimal way, or not at all. Finally, the textual analysis will show that Descartes' terminology allows for a rather natural reading of sensory perception in which, as a result of the (PD), the mind is active somehow.

Within the structure of the dissertation, the overall aim of this chapter is to locate the starting point of the claim that Descartes held a causal model for sensory perception, and that the mind has a substantial role in this causal model. This role, I anticipate here, will be that of contributing to the representational content of sensory ideas. This hypothesis will be spelled out by means of different arguments throughout this work. For now, let us look in finer detail at the dissimilarity between physical and mental states in the Cartesian context.

SECTION 1. THE PROBLEM OF DISSIMILARITY

In this section I outline the (PD). I start with a brief preliminary on the framework of mechanism and then I focus on characterising the (PD) following the Cartesian texts.

1.1. PRELIMINARY: DESCARTES' THEORY OF MATTER

Descartes' mechanism as presented in *The Treatise on Light* sets forth a picture of the physical world in which all phenomena can be explained via a theory of matter according to which: (1) matter is homogeneous, that is, there are no qualitative distinctions between types

of matter, (2) matter is inert, that is, there are no forces or activities internal to matter, and (3) the properties of natural objects can be explained by appealing to a small range of quantifiable characteristics of micro-particles. In the Cartesian theory, these features are the shape, size, and motion of micro-corpuscles.² As other natural philosophers at the rise of the seventeenth-century scientific revolution (such as Galileo, Bacon, and Beekman, amongst others), Descartes aimed to replace the Aristotelian-inspired theory of matter of the Scholastics. Broadly, their natural philosophy was characterised as empiricism loaded with the ontology stemming from hylomorphism. In this regard, a specific target of Descartes' theory of matter was to eliminate an allusion to the Aristotelian-Scholastic notions of 'substantial form' and 'real quality' in scientific explanation.³

In this new picture of the physical world, what the Scholastics had called 'real qualities' are reduced to quantitative notions. This is a view that appears as early as in the *Treatise on Light* as well as in mature works like the *Principles*:

If you find it strange that, in explaining these elements, I do not use the qualities called 'heat', 'cold', 'moistness', and 'dryness', as the Philosophers do, I shall say that these qualities appear to me to be themselves in need of explanation (...) not only these four qualities but all the others as well, including the forms of inanimate bodies, can be explained without the need to suppose anything in their matter other than motion, size, shape, and arrangement of its parts (TL AT XI

² For an explication of these three characteristics, see Gaukroger (2000). A more complete outline of Descartes' physics should include not only the characteristics of matter, but also the basic motion principles. Gaukroger (2000:384) identifies two of them: the principle of centrifugal force and the principle of rectilinear inertia. I won't elaborate on that because it is a matter of debate within the literature on Cartesian physics and it surpasses the aim of the chapter. Cottingham (1993:61), for instance, points out that it can be doubted whether everything that Descartes wants to attribute to matter can be reduced to the size and behaviour of micro-corpuscles. For example, he conceived of motion as a 'mode of extension', but it is not clear how exactly motion is derivable in such a way. The notion of force runs into similar problems.

³ Broadly, the notion of substantial form refers to the fundamental group of the essential properties of a thing. In this sense, a substantial form is what underlies 'real qualities' that are accidental to it. These accidents, however, are 'real' in the etymological sense of being a proper 'res' (Latin for 'thing'). Although Scholasticism included variations from one author to another, we can say, in general, that real qualities are independent traits of objects that exist over and above matter. I expand on this issue in Chapter Four. There, I offer the details of Descartes' rejection of real qualities for elucidating his views on ideas of secondary qualities.

25-6/G 18)

I recognise no matter in corporeal things apart from what the geometers call quantity (...) *i.e.* that to which every kind of division, shape and motion is applicable (Pr II 64, AT VIII 78/CSM I 274)

The conception of matter as extension⁴ and its description in terms of its geometrically reduced properties (shape, size, position, and motion) constituted one the hallmarks of Cartesian physics⁵ and, consequently, determined physiological descriptions as well. The *Treatise on Man*, the *Optics*, the *Passions*, and the *Description of the Human Body* contain remarkably detailed accounts of mechanistic physiology. Within the domain of physiology, mechanism allowed Descartes to eliminate the Aristotelian-Scholastic talk about different souls in order to account for the bodily functions: ‘to explain these functions, then, it is not necessary to conceive of any vegetative or sensitive soul, or any other principle of movement or life’ (TL AT XI 202/G 169). Just like substantial forms and real qualities, the vegetative and sensitive souls are notions that do not have a place in scientific explanation.⁶ To be precise, Descartes claimed in the *Treatise on Light* that the terms that the ‘philosophers’ (the Scholastics) used for describing qualities seemed ‘in need of explanation’ (AT XI 26/G 18) because he considered them obscure, redundant, and, consequently, explanatorily powerless. They are obscure because when we speak of these notions we don’t have any specific idea by which to conceive them (Hattab 2009:19). To this effect, Descartes writes to Mersenne: ‘my principal reason for rejecting these real qualities is that I do not see that the human mind has

⁴ As a paradigmatic definition of matter as extension, let us take the one from the *Principles*: ‘The nature of matter, or body considered in general, consists not in its being something which is hard, or heavy, or coloured, or which affects the senses in any way, but simply in its being something which is extended in length, breadth and depth’ (Pr II 4 AT VIIIA 42 /CSM I 224).

⁵ Note, at the same time, that ‘extension’ does not occupy the place that ‘prime matter’ had in Ancient and Medieval theories. What takes the position of ‘substance’ is not ‘extension’, but the particular arrangements of shapes, sizes, and motions of micro-particles making up a specific body. As Hattab (2009) puts it, ‘Physically speaking matter is not pure extension, but delimited extension, in the sense that God has attributed to it the basic divisions, proportions, motions, and relations that give rise to the particular shapes and motions we observe. The starting point for physics is thus not extension in general but the physical forms of the different types of simple and mixed bodies’ (2009:148).

⁶ As Gaukroger points out, ‘the postulation of a hierarchy of souls does not actually explain anything: it does nothing more than label the stages at which various differences are considered to emerge, while giving the impression that the cause of the difference has been identified’ (2000:385).

any notion, or particular idea, to conceive them by; so that when we talk about them and assert their existence, we are asserting something we do not conceive and do not ourselves understand (AT III 649/CSMK III 216). They are redundant, within Descartes' micro-corporcularism, because what they purport to explain can be captured (more simply) by appealing to a small range of properties of micro-particles. There is no need, therefore, to posit entities *over and above* matter. As a result, those Scholastic notions (at least as Descartes understands them) cannot explain natural phenomena properly. In fact, the notions themselves seem to be in need of explanation. In this scenario, mechanism was meant to increase the explanatory power of physical explanations in general and physiological explanations in particular.

In the case of sensory perception, the target of Descartes's criticism was a standard version of the Scholastic theory of sensory perception whose appeal to the notion of 'sensible species' was to be deemed unintelligible within the new quantitative framework of mechanism. More particularly, Descartes' aim was to put forward a theory of sensory perception that eliminated the species ('flitting images', as he irreverently wrote in the *Optics*, AT VI 85/CSM I 154)⁷ by introducing a system of motion correspondences transmitted from the object, through the nervous system by means of the animal spirits, and up to the brain.⁸ There, a structural representation of the geometrically reduced properties transmitted from the object is formed. Importantly, this process gives up the assumption of resemblance between objects, brain states, and ideas. In this respect, we can refer to it as a variety of 'isomorphism'. This is, indeed, different to the Scholastic theory that Descartes criticises. According to it, sensory representations resemble the properties of objects. When perceiving an object, a sensible species of their qualities (a 'form' without 'matter') is transmitted as a *likeness* to the perceiver. Given the transfer of this type of form from the object to the subject, resemblance was the

⁷ Descartes ridiculed such a doctrine while presenting a mechanistic approach that was meant to increase the intelligibility of the process of sensory perception. This is the passage from the *Optics*: 'Hence you will have reason to conclude that there is no need to suppose that something material passes from objects to our eyes to make us see colours and light, or even that there is something in the objects which resembles the ideas or sensations that we have of them (...) By this means, your mind will be delivered from all those little images flitting through the air, called 'intentional forms', which so exercise the imagination of the philosophers' (AT VI 85/CSM I 153-4).

⁸ I elaborate on this model in the upcoming sections.

condition and indication of sensory perception. Descartes devoted most of Discourse Four of the *Optics* to refute such an account by showing its obscurity and lack of explanatory power, and he recommends to be careful not to assume, ‘as our philosophers commonly do’, that to perceive something means that the soul contemplates images transmitted by the object (AT VI 112/CSM I 165). Being aware that his own isomorphism involves a minimal notion of resemblance of a quantitative kind (a one-to-one mapping of the object between object and brain in terms of its geometrically reduced properties), he qualifies his criticism of the Scholastic conception by adding that, in any case, our understanding of the notion of neural image is what needs to change: ‘at any rate we must conceive the nature of these images in an entirely different manner from that of the philosophers’ (*ibid.*).⁹

The interaction between the external object and the brain constitutes the first phase within the simultaneous process of sensory perception. This is a purely corporeal phase. Once the mind enters the picture, a problem of dissimilarity appears. How can sensory ideas be accounted for by certain motions in the brain? I look into this problem in the following section.

1.2. THE CARTESIAN QUALITATIVE GAP

The problem of dissimilarity (PD) is commonly described as the lack of similarity between physical and mental states. On one hand, given the mechanistic, micro-corporealist framework of Descartes’ natural philosophy, the physical state includes (1) the arrangements and motions of particles of matter constituting an external object and (2) what is transmitted from these to the brain, thus forming an isomorph (*i.e.* a structural representation) of the object. These two instances relate to each other by means of an isomorphic relation than can be explained by the principles of Descartes’ mechanism. On the

⁹ The criticism continues with Descartes’ assessment of the wrong direction of fit of the standard Scholastic account: ‘For since their conception of the images is confined to the requirement that they should resemble the objects they represent, the philosophers cannot possibly show us how the images can be formed by the objects, or how they can be received by the external sense organs and transmitted by the nerves to the brain (Op AT VI 112/CSM I 165)

other hand, the mental state is, in this picture, the sensory idea formed in the mind. Note that, for Descartes, there is a first instance of varying dissimilarity between the external object and the isomorph in the brain (1 and 2). This instance is not problematic because of an available mechanistic explanation provided by a micro-corpusecularian theory of matter and spelled out in terms of motion correspondences carried through the nerves to the brain by the action of the animal spirits. The same one-to-one mapping mechanism, however, is not available for the interaction between the brain and the mind.

Within the Cartesian system, the (PD) arises only insofar as sensory perception involves a second instance of ‘representation’ that is dissimilar in a different way. The second instance constitutes the ‘mental phase’ of the simultaneous process of sensory perception and it refers to the translation of the corporeal isomorph into an idea formed in the mind. The idea of the external object that is formed in the mind is qualitatively different from its bodily causes. It is different from the arrangements and motions of micro-corpuses of matter constituting the external object,¹⁰ and it is different from the structural representation formed in the brain that corresponds to those. We can say, therefore, that there is a ‘qualitative gap’ between physical and mental states (understanding this pair of terms under Descartes’ characterisation as presented). We can put forward the following first working characterisation of the problem:

(PD) The lack of similarity between (1) the arrangements and motions of micro-corpuses constituting material bodies, *together* with their transmitted structural representation formed in the brain and (2) the idea of the material body that it is formed in the mind.

The question, in more contemporary terms, would be how the qualitative character of our sensory experiences can be captured by, or can arise from, the categories of physical science

¹⁰ Descartes also refers to the arrangements and motions of particles constituting objects as the ‘true nature’ and the ‘essential nature’ of bodies (see Pr I 73, AT VIIIA 37/CSM I 220 and MM, AT VII 83/CSM II 57-8). Our sensory perceptions, certainly, do not have a content that reflects the essential constitution of bodies. I will delve into this topic in Chapter Four, where I analyse Descartes’ theory of sensory perception from the perspective of a distinction between primary and secondary qualities.

(Cottingham 1993:149).¹¹ Let us now look at the way in which Descartes himself expresses this qualitative gap. In the Fourth Discourse of the *Optics*, in the context of an analogy between the structural representation formed in the brain and an engraving, Descartes summarises his programme as follows:

Now we must think of the images formed in our brain in just the same way, and note that the problem is to know simply how they can enable the soul (*donner moyen*) to have sensory perceptions of all the various qualities of the objects to which they correspond - not to know how they can resemble these objects (AT VI 113-14/CSM I 166, Latin terms added).

Note that what Descartes describes in this passage as not problematic is the corporeal phase of sensory perception: the problem is not whether the structural representation resembles the object, of how it might do that ('the problem is (...) not to know how they can resemble these objects'). The problem lies in the mental phase of sensory perception, that is, in determining how a structural representation that is of quantitative character can give rise to a qualitative outcome in the mind. This is the (PD) in Descartes' words.

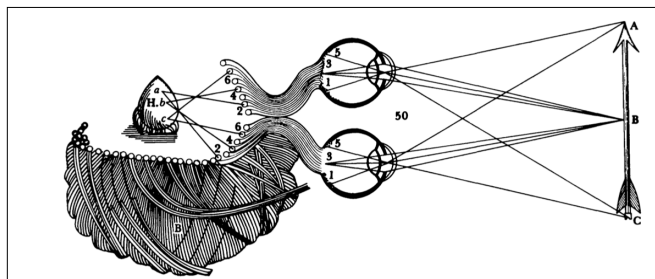
Before going any further, let us recapitulate the process briefly. According to Descartes, the micro-corpuscles constituting an external object make actual contact with our senses and transmit a pattern of their arrangement and motion. This pattern is transmitted to the brain through the nerves by the action of neural information carriers that Descartes called 'animal spirits'. The animal spirits are minuscule physical bodies that operate as information carriers through the nervous system. Such information about the external object results in a structural representation formed in pineal gland, which is located in the internal part of the brain and where, as we shall see, the soul 'exercises its functions' (PS II 31, AT XI 351/CSM I 340). Insofar as the structural representation is a one-to-one mapping of the arrangement and motion of micro-corpuscles constituting a particular material object, it can be explained by appealing to the quantitative notions of physical science.

¹¹ Interestingly, the (PD) presents a worry that is very much alive in contemporary philosophy of mind, and that translates well into an early modern version of what has been called the 'explanatory gap', following the term coined by J. Levine (1983)

As an example of Descartes' development of an intricate physiological system of motion correspondences, take the following description case of close vision from the *Treatise on Man* (in reference to the figure below, reproduced from the treatise):

Thus, owing to the different ways in which the rays exert pressure on the points 1, 3, and 5, to trace a figure on the back of the eye corresponding to that of object ABC (...) it is evident that the different ways in which the tiny tubes 2, 4, 6, and so on are opened by the fibres 12, 34, 56, etc., must also trace it on the inside surface of the brain. Suppose next that the spirits that tend to enter each of the tiny tubes 2,4,6 and so on do not come indifferently from all points on the surface of gland H (the pineal gland) but each from one particular point: those coming from point *a* on this surface for example tend to enter tube 2 (...) and so on with others (AT X 175/G 148-9 clarification added)

Figure 1. *Physiology of close vision*¹²



However, when our senses get acquainted with these different properties, our mind does not get acquainted with the particular arrangement and motion of micro-corpuscles bringing our very ideas of them. Instead, we experience an object qualitatively. The content of our sensory experience, Descartes insists, does not exist in objects *as such*. It is clear from the texts that 'Cartesian sensations constitute the qualitative character or what-it-is-like-ness, of human experience' (Simmons 1999:347).¹³ Dissimilarity between the isomorph and the outcome

¹² This is the drawing that figures in the AT edition of the Works of Descartes. Although probably based on Descartes' own sketches, the illustrations that appear in *The World* are not his. This one appeared in the first edition of the *Treatise on Man*, published posthumously in 1662, edited by Florentino Schuyf.

¹³ I am aware that a question might arise here about a distinction between ideas of primary and secondary qualities. This topic is addressed in Chapter Four.

formed in the mind is perplexing because of the absence of an immediately intelligible explanation for the fact that ideas of external objects exhibit a representational content that is dissimilar to its own cause (Rozemond 1999:450). Descartes restates the (PD) frequently, including everyday examples in his exposition of the phenomenon in *The Treatise on Light*. He offers an example involving the sense of hearing and another involving the sense of touch:

A man opens his mouth, moves his tongue, and breathes out: I see nothing in all these actions which is in any way similar to the idea of the sound that they can cause us to imagine (...) if the sense of hearing transmitted to our thought the true image of its object, then instead of making us think of the sound, it would have to make us think about the motion of the parts of the air that are vibrating against our ears (AT XI 5/G 5).

After having presented a first working definition of the (PD), as well as a general overview of the corporeal phase of sensory perception, a question appears: what is it exactly that makes dissimilarity a problem for Descartes? As we will see, he did not seem concerned about interaction between substances as *such*, but he insisted on the (PD) frequently. In the following section I tackle this question.

1.2.1. What makes dissimilarity a problem?

I mentioned above in passing that Descartes' formulation of the (PD) shares some features with the contemporary problem of the explanatory gap in the philosophy of mind. At this point, it seems to share at least a consideration about intelligibility. A standard introduction to the explanatory gap presumes that even after getting to know everything that science can tell us about the conscious mind and the brain, there is something about their relationship that still remains inscrutable (Papineau 2010).¹⁴ Descartes' (PD) expresses a similar perplexity, in his case arising from the scientific framework of early modern mechanism. He was

¹⁴ I am aware of the fact that Papineau defends the position that such a standard characterisation of the explanatory gap only appears within frameworks that are already dualist (2010). However, to engage in the contemporary debate of the formulations of the explanatory gap is beyond the aim of this dissertation.

particularly straightforward about it towards the end of Part Four of the *Principles*, where he dealt with issues regarding mind-body interaction:

But there is *no way of understanding* how these same attributes (size, shape and motion) can produce something else whose nature is quite different from their own (...) *Not only is all this unintelligible*, but we know that the nature of our soul is such that different local motions are quite sufficient to produce all the sensations in the soul (...) we do not find that anything reaches the brain from the external sense organs except for motions of this kind (Pr IV 198, AT VIII 322/CSM I 285, emphases added)¹⁵

Now, I agree with Rozemond's important point that the (PD) is not reducible to the Heterogeneity Problem, that is, the so-called problem of interaction between different finite substances: 'res extensa' and 'res cogitans' (hereafter referred as HP)¹⁶. Descartes is certainly not concerned in the same way about both of them (Rozemond 1999). In fact, whereas Descartes dismissed on several grounds and with more or less vehemence the alleged problem of interaction between substances, the (PD) is what commonly drives many of his descriptions, examples, and worries concerning sensory perception. As Rozemond puts it: 'although he speaks of the dissimilarity between ideas and the bodily states that cause them, he is not concerned with the fact that they are ideas. Rather he is concerned with the representational content of sensory ideas: such ideas appear to represent things that do not resemble their bodily causes' (1999:450). In order to distance Descartes from the (HP) and show the importance of the (PD), Rozemond introduces a helpful analysis of the two problems. While the (HP) arises from the difference in nature between the cause (body) and the patient (mind), the (PD) points to a difference between cause (particular bodily motions) and effect (a particular idea). Whereas Descartes did not regard the first difference as problematic, he did worry about the second.

¹⁵ In this passage Descartes displays a rather hopeless tone. It is important to note, at the same time, that the effort that he put into discerning this process shows that such perplexities did not stop his philosophical endeavour. I will show this in the textual analysis of §2.

¹⁶ To my knowledge, the term 'Heterogeneity Problem' was first used in this sense by Richardson in 'The "Scandal" of Cartesian Interactionism' (1982). It has become common terminology in the literature since then.

Crucially, for Descartes the (PD) is not reducible to the (HP) because the former problem does not lie in the fact that a mode of body *cannot* cause a mode of mind. For him, interaction between finite substances is a given fact. More technically, he treated it as a ‘primitive notion’, a given fact about the constitution of a human being that can’t be scrutinised by reasoning. He answered the concerns of Elizabeth of Bohemia about substance interaction by appealing to three primitive notions and the way they are grasped. First, the soul is conceived by the pure understanding. Second, the body can be understood by the understanding alone, but it is better known when the imagination helps the understanding. Finally, the union of soul and body is better understood when staying away from philosophy, perhaps as a given common sense fact. It seems that Descartes is saying that philosophical reasoning cannot account but obscurely for the unquestionable union of the finite substances in the human being.¹⁷ As we shall see in Section 2, this statement is also reflected in Descartes’ several reactions to the charge of endorsing an impossible interaction between different substances.

One could object at this point that Descartes is not being too clear about what exactly makes dissimilarity a problem. If it is only a matter of unintelligibility, perhaps he could have resorted to the primitive notions again, and claim that the correspondences between structural representations and ideas are simply non-analysable in the same way in which the union of the mind and body is. Nevertheless, his numerous treatments of the whole process of sensory perception show otherwise. He made a clear effort of discerning how the qualitative gap could be bridged, even though he did not provide a perfectly unambiguous doctrine (To start with, however, we can find in this narrative some terminological patterns that point to Descartes’ doctrine, as I shall show in §2).

¹⁷ ‘After having distinguished three sorts of ideas or primitive notions which are each known in a particular way and not by a comparison of the one with the other –that is, the notion that we have of the soul, that of the body, and the union which is between the soul and the body- I ought to have explained the difference between these three sorts of notions (...) The soul is conceived only by the pure understanding, the body, that is to say, extension, shapes, and motions, can also be known by the understanding alone, but it is much better known by the understanding aided by the imagination; and finally, those things which pertain to the union of the soul and the body are known only obscurely by the understanding alone, or even by the understanding aided by the imagination; but they are known very clearly by the senses. From which it follows that those who never philosophize and who use only their senses do not doubt in the least that the soul moves the body and that the body acts on the soul...’ (AT III 691-692/S 69).

Now, these considerations might prompt the conclusion that for Descartes, the (PD) arises primarily for a reason other than unintelligibility. Rozemond (1999) has suggested — correctly, I believe— that it has to do with the issue of arbitrariness. The point is that what makes the explanatory gap a Cartesian problem is the fact that the elusive character of the translation from the isomorph to the idea gives to the production of the representational content of sensory ideas an air of arbitrariness. Arbitrariness is simply an undesirable feature in a world in which natural mechanisms exhibit perfect nomological behaviour and, most importantly, in a world that is the creation of an all-powerful, omniscient, and benevolent God. I believe, as a consequence, that Descartes' concern about the (PD) is incidentally about unintelligibility and primarily about arbitrariness.

Again, for Descartes it is a given that the brain acts on the mind. Interaction is a fact. There is simply, no other way of *being human*. However, the reductionist mechanistic explanation that linked the two modes of extension is not available for connecting the structural representation formed in the brain with the idea that, as a matter of fact, is formed in the mind as a simultaneous outcome. We are left with sets of correspondences between isomorphs and ideas that seem arbitrary even though they exhibit nomological regularity. Why does a specific arrangement and motions of micro-corpuscles *consistently* gives rise to, for instance, my seeing an apple as round or green, or as tasting crisp? Again, in Descartes own words 'if the sense of hearing transmitted to our thought the true image of its object, then instead of making us think of the sound, it would have to make us think about the motion of the parts of the air that are vibrating against our ears' (AT XI 5/G 4). At this point we can put forward the following qualified characterisation of the (PD):

(PD)* The lack of similarity between (1) the arrangements and motions of micro-corpuscles constituting material bodies, *together* with their transmitted structural representation formed in the brain and (2) the idea of the material body that it is formed in the mind. This is problematic because the fact that the representational content exhibited by a sensory idea does not resemble the cause of the idea gives to the process of sensory perception an air of arbitrariness.

Descartes made a patent effort in emphasising the law-like behaviour of the interaction between brain and mind. Given the (PD), the difficult part will be to defend an account (as I think Descartes attempted to do) that manages to avoid two extremes. The first is a

mechanisation of the mind, that is, an explanation of mental processes by appealing only to the properties of matter. On the other hand, given the qualitative gap between physical and mental states, Descartes' account should clarify how this gap is bridged without introducing occasionalism (at least, strong occasionalism *à la* Malebranche).¹⁸ The reason for this view is that as far as Descartes' ontology goes, and given his depictions of the process of sensory perception (that I present in more detail in the following section), it is clear that he envisaged it as a process grounded on the powers of the human brain and the human mind while preserving the different essential attributes of each substance. Furthermore, Descartes seems to generally identify the relation between physical and mental states (sensory perceptions) as representational, but I think that he is at pains to describe exactly how this happens.¹⁹ There is ultimately an appeal to God's ordination and benevolent nature, but to reduce to that all Descartes has to say about the interaction between brain and mind in sensory perception would be uncharitable, and it would place him closer to a version of occasionalism that I do not think he wanted to endorse.

At any rate, a close analysis of the texts will show whether he succeeded in these endeavours. To start with, a good part of Descartes' (sometimes rather perplexing) claims, as well as his choice of words can be explained by placing the (PD) at the background. It is both a

¹⁸ Briefly, strong occasionalism is a view about causation in which what explains the concurrence of certain physical states with certain mental states is the causal activity of God. In Malebranchian occasionalism, a physical state is an 'occasion' for God to exert 'his' own causal efficacy. I explore a few more details of occasionalism in Chapter Two, in the context of defending a causal-semantic model against rival causal theories (§4.2).

¹⁹ There is, of course, the further question of *what* makes, for Descartes, an idea a representation in the first place. Although I do not engage with this issue here, I am aware that several answers are available in the literature. Most recently, De Rosa (2010) has defended a descriptivist-causal account, especially in dialogue with Simmons' teleofunctional account (2003, 1999). For the purposes of this chapter, however, it will be sufficient to point out that the texts effectively show Descartes as conceiving the relation in terms of representation. In this sense, I agree with De Rosa in that a non-representationalist interpretation is untenable (2010:5). Textual evidence appears succinctly as early as in the Rules: 'the thing itself which this idea is to represent should be displayed to the external senses' (AT X 417/CSM I 43), together with the rest of Rule 12). It becomes more sophisticated in the *Optics* (see, for instance AT VI 113/CSM I 165, for an analogy with the representational character of an engraving), the *Principles* (for instance Part I 17 & 68 '...one idea represents one thing and another represents another...'), and the *Passions* (I 43, 47, AT XI 361, 365/CSM I 344, 346 '...the pores of the brain whose opening enables the thing to be represented'). *The World* also contains claims about representation that will be dealt with in Chapter Two because of their connection with the issue of natural signs.

phenomenon that he aims to capture in describing the process of sensory perception, as well as a pressing problem for him to solve. I explore the textual grounds for this claim in the next section.

In this section, I have sharpened the definition of the Cartesian problem of dissimilarity between physical and mental states (PD). After presenting a short overview of his theory of matter in general, and his mechanistic physiology in particular, I have claimed that the (PD) is not equivalent to the (alleged) problem of interaction between the finite substances. The pressing issue for Descartes is to determine the elusive workings of the (guaranteed) interplay between the three elements: the external object, the structural representation in the brain, and the sensory idea. Following Rozemond's reasoning (1999), I have identified the threat of arbitrariness as Descartes' main worry regarding the phenomenon of dissimilarity. Taking all these points into consideration, in the next section I examine Descartes' descriptions of brain-mind interaction in sensory perception. The objective of this textual analysis is to show that Descartes understood interaction between brain and mind in causal terms. My contribution will be to single out in Descartes' narrative a carefully established balance between the appeal to a mechanical form of causation and the evoking of a different type of genuine causal powers.

SECTION 2. A CAUSAL NARRATIVE FOR BRAIN-MIND INTERACTION

In this section, I will focus more narrowly on the passages in which Descartes attempts to describe the brain-mind stage of sensory perception. This exegesis will serve three purposes. (1) First, I intend to counter a few interpretations in the literature that, for different reasons, regard the interaction between brain and mind as a non-causal one (for example, Yolton 1984, 1996, 2000, Broughton 1986, Gorham 2000). (2) Second, I provide an insight into the structure of Descartes' narrative so as to discover in it a terminological balance between the way of depicting efficient and non-efficient causation. I will defend the claim that Descartes contemplated the involvement of a peculiar type of cause for brain-mind interaction in sensory perception. The texts show Descartes as concerned with the type of cause, and not with the

absence of it. (3), Third, this textual analysis will prepare the basic grounds for the semantic *and* causal interpretation that I will develop in Chapter Two.

We have already seen that, if we are to break down the simultaneous process of sensory perception as Descartes conceived it, the first phase (the physical one) involves micro-corpuscles of matter impacting on the relevant sense organ, where a pattern of these motions is formed and carried through the nerves and to the brain by means of the animal spirits. The outcome of the physical process is a structural representation (or isomorph) of the object. The second phase of the process (where the mind enters the picture) involves the pineal gland as the particular place in the brain where the pattern of the external object is ready for the ‘consideration’ of the mind, although that is, indeed, a rather obscure notion. The following passage is from the *Treatise on Man*. Note that, whereas Descartes explains the first phase by means of a chain of efficient causes activated by actual physical contact, I think that he is carefully vague in describing the production of the idea in the mind:

Only these (the structural representations located in the pineal gland) should be taken as the forms or images which, when united to this machine, the rational soul will consider directly when it imagines some object or senses it (AT XI 176-7/G 149, clarification added)

Before going any further, I add here a terminological caveat about the notion of ‘efficient cause’ that will serve not only for this section, but for the rest of the dissertation. By efficient cause, I refer here to causation by contact. That is to say, efficient causation is the variety of causation that does *all* the work in a mechanistic picture of the natural world. In opposition to an Aristotelian natural philosophy, Descartes’ mechanism rules out final causes for explaining the natural world. The ‘aimless efficient causation’ of impact is necessary and sufficient for accounting for all physical phenomena (Hatfield 1992:260). I will use the notion in this sense, which is how it is commonly employed in the Cartesian scholarship.

Before starting the textual analysis of Descartes' descriptions of sensory perception, I offer here a short assessment of a few aspects of Yolton's view as a token example of a non-causal reading of the interaction between brain and mind in sensory perception.²⁰

Yolton rightly identifies the fact that body-to-mind interaction encompasses two interactions of a different kind: the purely physical interaction between external bodies and the perceiver's body, and the interaction that happens when the external bodies affect the mind by means of 'disturbances in the brain' (2000:577). Given Descartes' appeal to certain signs instituted by nature 'to make us have the sensation of light' (AT XI 4/G 4), Yolton offers an insightful conceptualisation according to which the structural representation plays a double role: it is a physical (neural) event produced by the external object, and it is *also* a sign of the external object in relation to the mind, in the sense of producing (somehow) cognitive events in the mind. I believe that such a conceptualisation is a correct one, but from there Yolton goes on to conclude that the two instances of interaction are different in that one is causal (the purely physical one) and the other is semantic *and thus* non-causal (the brain-mind stage of the process). Yolton seems to assume that the only causation model that *there is*, or (more charitably) the only causation model that Descartes could have considered, is the one provided by the mechanistic picture of efficient causes. That leads him to a clear-cut distinction between 'signifying and causing' (2000:579). He regards it as having more explanatory power than a distinction between types of causes: 'mind and cognition are thus connected with the world, but the connection is precisely that which is proper to cognition: signification, not resemblance or causal' (1984:30). The main problem with Yolton's reading is that there aren't any *a priori* reasons for considering a semantic relation as non-causal. Rather, signification could perhaps be a form of causation.

It is particularly interesting to note that the way in which Yolton outlines how the external object relates to the brain state and at the same time (and in a different way) to the correspondent idea formed in the mind, mirrors quite well one way in which Descartes

²⁰ The consideration of Yolton's view is cursory here because it will appear again in Chapter Two, given that he endorses a semantic reading of sensory perception. I will briefly present the non-causal interpretation of Gorham (2000) in Chapter Three because of its bearing to the issue of the innateness of all ideas.

described a distinction between types of causes in the *Comments*. Now, even if vague in some respects, it seems that Descartes contemplated a model for distinguishing how an event can causally relate to another. An event can be a ‘proximate and primary’ cause (A is the sufficient condition for B to exist) or a ‘remote and accidental’ one (A is the remote cause of E by inciting B to proximately cause E). Crucially, both relations are labelled as ‘causes’:

...something can be said to derive its being from something else for two different reasons: either the other thing is its *proximate and primary cause*, without which it cannot exist, or it is a *remote and merely accidental cause*, which gives the primary cause occasion to produce its effect at one moment rather than another (AT VIIIIB 360/CSM I 305, emphases added)

In what follows, I will provide textual grounds for the claim that, for Descartes, the brain states resulting from sensory perception operate as causes for the production of the correspondent adventitious idea in the mind. I will first briefly turn my attention to the passages in which Descartes deals with the general notion of interaction between finite substances (irrespective of whether this is body-to-body or body-to-mind). By showing that Descartes regarded substance interaction as an intelligible causal relation in the following preliminary section, I will reinforce the main claim that, being attentive to Descartes’ use of the terminology, one cannot but defend a view in which brain states relate causally to the mind during sensory perception.

2.1. PRELIMINARY: SUBSTANCE INTERACTION AS AN INTELLIGIBLE CAUSAL RELATION

First of all, some of the crucial passages that I take as favouring a causal reading of brain-mind interaction target the problem of heterogeneity (PH). These passages involve the general notion of interaction between finite substances in general, of which the interaction between brain and mind constitutes only one species. Consequently, some of these passages on their own are not decisive for advancing a causal reading of brain-mind interaction, but they provide the preliminary for the interpretation to follow, insofar as they reveal Descartes as conceiving substance interaction as a non-problematic feature of his system and, presumably,

as a causal transaction of a peculiar kind. This kind is one that differs fundamentally from the causal transaction operating in interaction between bodies (*i.e.* efficient causation).

For describing a non-efficient causal transaction, Descartes tends to employ words with strong connotations of activity, such as 'power' or 'action'. Again, these textual occurrences appear mainly in his responses to the alleged problem of heterogeneity — a challenge notably raised by Gassendi in 1641 and by Elizabeth in 1643. For instance, in his objections to Meditation Six, Gassendi charges Descartes with inconsistency given his simultaneous commitment to the existence of two intrinsically different finite substances (mind and body) and to interactionism at the same time (the view that body and mind causally influence each other somehow):

You still have to explain how that 'joining and, as it were, intermingling' or 'confusion' can apply to you if you are incorporeal, unextended and indivisible (...) How can something corporeal take hold of something incorporeal so as to keep it joined to itself? And how can the incorporeal grasp the corporeal to keep it reciprocally bound to itself, if it has nothing at all to enable it to grasp or be grasped? (AT VII 343-4/CSM II 328-9/)

Elizabeth expressed the same concern with a more detailed description of the causal requirements for interaction to obtain. As well as Gassendi's, her criticism reveals a commitment to a purely mechanistic model of causation *i.e.* one in which efficient causes bring about their effects by contact and ultimately by virtue of a series of physical micro-events. Within such a framework, mind-to-body and body-to-mind causal transactions appear to be impossible given the immateriality of the mind:

So I ask you please to tell me how the soul of a human being (it being only a thinking substance) can determine the bodily spirits and so bring about voluntary actions. For it seems that all determination of movement is made either by the impulsion of the thing moved, or it is pushed either 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 from the notion that you have of the soul, and the other appears to me incompatible with an immaterial thing (AT III 661/ S.62)

In his responses to these criticisms, Descartes highlights what he takes to be a misunderstanding concerning the causation model at stake. Essentially, he considers that those charging him with this sort of inconsistencies erroneously assume the interaction between mind and body involves the same type of cause as interaction between bodies. His reply to Gassendi is rather dismissive and consists mainly of a denial of the problem with emphasis on the fact that mind and body interaction should not be assimilated to interaction between bodies: ‘Thus when you try to compare the intermingling of mind and body with the intermingling of two bodies, it is enough for me to reply that we should not set up any comparison between such things’ (Sixth Set of Objections, AT VII 390/CSM II 266).

If we are to defend a different, but still causal, story for brain-mind interaction, however, we should find Descartes employing a more straightforward causal language, while being more precise in how exactly the two types of causal interaction differ. Crucially, he described the interaction in terms of ‘powers’ (*force* in the original French) in his response to Elizabeth, although only mentioning the case of mind-to-body interaction:

Thus I believe that we have heretofore confused the notion of power with which the soul acts on the body with the power one body has to act on another (AT III 667/S.66)

The issue reappears in a letter to Clerselier included as an appendix in the Fifth Replies. This time he characterises the relation in terms of ‘action’ and, crucially, making no distinction in the treatment of the two directions of interaction:

...the whole problem contained in such questions arises simply from a supposition that is false and cannot in any way be proved, namely that, if the soul and the body are two substances whose nature is different, *this prevents them from being able to act on each other*. (AT IX 213/CSM II 275, emphasis added).

Descartes then goes on to make an insightful point about the intelligibility of interaction between substances stemming from his ontology. Namely, that there is a more serious threat to intelligibility in acknowledging the existence of ‘real qualities’ or ‘accidents’ like heat or weight as acting on bodies, since that presupposes a more fundamental difference between the two entities involved in interaction. This fundamental difference is, presumably, an

ontological asymmetry. While mind-body interaction postulates interaction amongst entities in the same ontological rank (finite substance), the action of a quality like heat on a body postulates an asymmetrical causal transaction between an accident and a substance (Phemister 2011:88).²¹

So much for Descartes' remarks about the causal description of substance interaction in general. These passages have just provided us with the framework for a more philosophically interesting exegesis concerning a causal reading of brain-mind interaction in particular. Let us turn now to the passages in which Descartes deals specifically with this relation, which is the process of sensory perception. In what follows, I will show that, while not being explicit about the particular type of cause at stake, Descartes' narrative when describing the process of sensory perception reveals a delicate balance between the dismissal of efficient causation and the evoking of other type of genuine causal powers. These powers emerge from the very configuration of the brain and the mind.

2.2. A DELICATE EQUILIBRIUM: THE CAUSAL NARRATIVE OF BRAIN-MIND INTERACTION

Causal language is prevalent when Descartes is describing brain-mind interaction, and in order to elucidate the metaphysical import of his choice of words, we have to reconstruct the process of sensory perception from the beginning. That is, we have to start with the corporeal phase involving body-to-body interaction, and then move on to brain-mind interaction while assessing whether a textual pattern can be identified for each of them.

²¹ This reasoning by Descartes relies here implicitly on one of the causal requirements that he introduces elsewhere. Namely, there must be at least as much formal reality in the cause as it is in the effect ('...that what is more perfect –that is, contains in itself more reality- cannot arise from what is less perfect' MM AT VII 40/CSM II 28). Given that accidents have less formal reality (less ontological status) than substances, their interaction is regarded as problematic: 'And yet, those who admit the existence of real accidents like heat, weight and so on, have no doubt that these accidents can act on the body; but there is much more of a difference between them and it, *i.e.* between accidents and a substance, than there is between two substances.' (*ibid.* 213/275).

Descartes' most detailed descriptions of (especially the corporeal phase of) the process of sensory perception are found in the *Treatise on Man*, and the *Optics*. First of all, Descartes presents there with great detail the first phase of sensory perception, that is, his mechanistic physiology, a description of the human body in which all biological processes are explained, as if the body were a machine, by appealing to the arrangement of the parts of the body.²² Again, the mechanistic approach to scientific explanation applied to the human body allowed Descartes to eliminate the appeal to unintelligible principles or powers that weren't reducible to law-like interactions between the physical parts of bodies and ultimately traceable to the interactions amongst the micro-particles constituting matter.

In the case of human beings, however, a mind or soul will be present as well in order to explain cognition, which encompasses the phenomena of thought and language. For Descartes, cognition marks the difference between human and non-human animals.²³ That is to say, the presence of a mind or soul joined to the 'machine' of the body cannot be assimilated to what Descartes regarded as the non-informative Scholastic account of the different souls, because the functions attributed to those can be, in fact, explained by the properties of matter. However, the attribute of thought and its different modes escape mechanistic explanations. This is where complexities begin.

These complexities are reflected in the fact that, in order to describe the brain-mind stage of the process of sensory perception, Descartes employs a plethora of expressions that, at least in some cases, seem to serve the purpose of circumventing the core of brain-mind interaction. The first step in the exercise of disentangling Descartes' description of brain-mind interaction

²² 'These functions (digestion of food, beating of the heart and the arteries, the nourishment and growth of the bodily parts, respiration, waking and sleeping, the reception of lights, sounds, *etc.*) follow in this machine from simply from the disposition of the organs as wholly naturally as the movements of a clock or other automaton follow from the disposition of its counterweights and wheels. To explain these functions, then it is not necessary to conceive of any vegetative or sensitive soul' (TM, AT XI 202/G 169, clarification added).

²³ For Descartes, the kind of language that non-human animals can develop is without 'reference' (AT III 574-5/CSMK III 303), and the difference between human beings and automata is that the latter only use 'word or sign by chance (*par hasard*)' (AT III 40/CSMK III 99). He also develops this point at more length in the *Discourse on the Method* (AT VI 56-7/CSM 140). The topic of language will be treated in Chapter Two, in the context of a comparison between conventional and natural signs.

is to show that he conceived it as a causal relation, and he displayed a noticeable terminological effort in describing brain-mind interaction so as to preserve a rather fragile equilibrium between the evoking of causal activity and the dismissal of efficient causation.

In the *Treatise on Man*, the *Optics*, the *Principles*, and the *Passions*, Descartes describes brain-mind interaction with terms such as ‘make the soul sense’ (*faire sentir*, TM, AT XI 146,176, similarly in Op AT VI 131), ‘affect the soul’ (*afficiunt*, Pr IV 189 AT VIIIA 316), ‘give means to the soul’ (*donner moyen*, TM AT XI 159 and Op VI 113), and ‘give occasion to the soul’ (*donner occasion*, TM AT XI 144, 151, 176). In all cases, what occurs in the soul as a consequence of brain activity is an idea of an external object. More precisely, expressions such as ‘affect’, ‘give means’, and ‘give occasion’ suggest that the soul *does something* as a result of brain activity. That something amounts to forming an idea of an external object. To begin with, some of these expressions exhibit an air of periphrasis that did not occur in Descartes’ forthright descriptions of purely physiological processes. By using different expressions, Descartes seems to avoid a commitment to a concrete production process. And by frequently using multiple-word expressions, he seems to be reporting what happens superficially in the brain-mind relation, instead of identifying the causation model by virtue of which it happens. As I sketched before, I think that the types of expressions that Descartes uses are a reflection of some uncertainties concerning the core of brain-mind interaction. This does not entail, however, that he did not have a picture for it at all. I do think that the expressions that he uses point to several features that he considered as key to sensory perception.

There is a particularly interesting passage in Part IV of the *Principles*, constituting the title and opening sentence of Principle 197, in which the brain-mind transaction is defined in terms of ‘excite’ and ‘stimulate’:

The nature of the mind is such that various sensations can be *excited* in it simply by motions in the body (...) the mere occurrence of certain motions in the body can *stimulate* it to have all manner of thoughts which have no likeness to the movements in question (AT VIIIA 320, CSM I 284, emphases added)

It is worth noticing that for the first sentence of the passage, the CSM translation reads ‘various sensations can be produced’, whereas Descartes uses the Latin verb ‘excitari’. I have

thus altered the English translation, given that there is a closer word, etymologically speaking (the English verb ‘excite’). Most importantly, this word might capture a type of relation between the brain and the mind that is closer to stimulation than to efficient causation. At the same time, it is difficult to conceive of ‘stimulate’ and ‘excite’ in non-causal terms. We can say that to stimulate something is to prompt its occurrence, and to stimulate someone is to encourage a certain activity on their part. I think that, in Descartes’ case, such verbs seem to suggest a productive activity that is neither expressed in the physical terms belonging to efficient causation nor described straightforwardly as the absence of a cause.

This is an example of what I take to be the delicate balance that Descartes maintains in the narrative for two purposes. (1) First, the narrative is intended at avoiding physical terms that could evoke some sort of *actual* contact between (the material) brain and (the immaterial) mind. (2) The narrative is constructed as to capture a cause of a different sort that acts in an equally law-like manner. For accomplishing this, Descartes frequently changes the terminology that refers to brain-mind interaction. This does not mean, however, that his choice of words is somewhat erratic.

The term ‘excite’ is restated a few sentences ahead in the same passage of the *Principles* for the same purpose: ‘the sensation of pain is excited in us merely by the local motion of some parts of our body in contact with another body’ (*ibid.* 321/284).²⁴ Again, ‘motion’ and ‘contact’ — as hallmarks of efficient causation— are used in the passage for characterising the instances of interaction between bodies. For the instance of interaction between the brain and the mind, however, ‘excite’ seems to be more pertinent. One can detect here, once more, the terminological balance in the description of the two types of interaction as well as Descartes’ attempt to convey a certain activity (excitation) that can hardly be read along occasionalist lines. I do believe that the most natural reading of a model for sensory perception that involves

²⁴ The original reads: ‘Atque ideo, cum clare videamus, doloris sensum in nobis *excitari* ab eo solo, quod *aliquæ corporis nostri partes contactu* alicujus alterius corporis localiter moveantur’ (emphasis added)

terms such as ‘excite’ and ‘stimulate’ is one that aims at grounding causal activity in the very configuration and causal powers of the brain and the mind.²⁵

The terminological balance in Descartes’ narrative can be also seen in a crucial passage from the *Treatise on Man*, in which he succinctly outlined interaction as follows:

The movement that they (the tiny fibres that make up the marrow of the nerves) will then cause in the brain, whose location must remain the same, *will give occasion to the soul* to have the sensation of pain (AT X 144/G 119, clarification and emphasis added)

Once more, it is important to note that I have altered Gaukroger’s translation, which reads ‘will *cause* the soul to have the sensation of pain’. In the original French, the word employed is ‘occasion’. It is important to notice Descartes’ change of narrative in the context of this passage. He is, again, describing a single process (sensation) with the two instances of different interaction that I have outlined in several places of this chapter: one is from body to body (from the external object to the brain), and the other is from body to mind. Note in the passage that for the first instance he uses the French verb ‘causer’ (‘ils causeront un mouvement dans le cerveau’) in order to capture the operation of efficient causes as conceived by mechanistic explanations. For the second one, however, he uses a more vague expression (‘*donner occasion*’) presumably pointing to a different sort of causal transaction.²⁶

The change of terminology is significant for Descartes’ concern about the types of causes and for his effort in presenting sensory perception as an intelligible and peculiar causal transaction between brain and mind that happens in a law-like way. It is worth restating, at the same time, that while he makes that terminological distinction in the type of operation, he does not describe it as the absence or denial of a cause. To my knowledge, nowhere in the texts we find such an explicit statement.

²⁵ I remind the reader that this is, at this point, a mere textual hypothesis. The materials for justifying this position will be given in the following chapters.

²⁶ The original reads: ‘donnera occasion à l’âme, à qui il importe que le lieu de sa demeure se conserve, d’avoir le sentiment de la douleur’ (AT X 144)

At this point, it could be objected to this reading that Descartes uses once the word ‘causer’ in the *Treatise on Man*:

For it is easy to understand that tube 2 (one of the tiny fibres constituting the optic nerve), for example, will be opened differently as the action causing it differs, whether this action is that causing sensory perception of the colour red, or of pleasure, or the action that I said causes sensory perception of the colour white, or of pain... (AT XI 176/G 149, clarification added)

Although it is certainly used for characterising sensory perception, the context is to some degree more general. Descartes is not referring precisely or exclusively to the point of brain-mind transaction as in the other passages, but rather he seems to be outlining the general theory of sensory perception conceived as a causal chain that begins in the ‘action’ of an external object. When Descartes mentions ‘action’ in the passage, he is referring to the arrangement of micro-corpuscles of matter constituting the external object, which sets off the physiological process involved in sensory perception. Strictly speaking, it is not this ‘action’ of the external object, but rather the brain motions occurring in a particular place in the brain (the pineal gland) that ‘makes the soul sense’, that ‘gives occasion’ or ‘means to the soul’, and that ‘affects the soul’. I take this passage to be an endorsement of a causal theory of sensory perception that encompasses a series of efficient causes and a brain-mind transaction that is frequently described by Descartes with verbs that carry significant connotations of causal activity. The usage of ‘excite’ and ‘stimulate’ for portraying the way in which the brain acts upon the mind are particularly noteworthy and seem to be in line with the connotations of a causal-semantic model for sensory perception, as I will explore in Chapter Two.

2.2.1. Initial implications of a causal reading

After having introduced Descartes ‘terminological equilibrium’, I sketch here a few initial implications of this textual analysis. These implications are, at this point, tentative. They will be appropriately argued for in subsequent chapters.

To begin with, rather than offering many unfinished and even contrary models, I read Descartes as presenting a complex causation process involving a chain of efficient causes that explain interaction between bodies *and* another type of cause that is described in terms of peculiar action (stimulation, excitation) and exhibits law-like stability. Also, as I see it, Descartes displays an effort in constructing a narrative that departs from strong occasionalism. The choice of words reveals he is attempting to ground sensory perception on the configuration and powers of the human brain and the human mind. When Descartes employs expressions with the word ‘occasion’ in them, it is clear that the agent that is triggered to act is not God, but the perceiver’s mind.²⁷ Take, for example, the following passage from the *Treatise on Man*, where he singles out the structural representation of the external object (the ‘figure’ in the passage) as that which gives the soul occasion to ‘sense’ different qualities. There is no allusion to any other causal agent:

By figure I mean not only things that somehow represent the position of the edges and surfaces of objects, but also anything which, as I said above, *can give the soul occasion to sense* movement, size, distance, colours, sounds, smells, and other such qualities (AT X 176/G 149 emphasis added)

Similar passages are found in the *Optics* (‘occasion the soul to have sensory perception of just as many qualities in these bodies...’ AT VI 114/CSM I 66) and in the *Comments on a Certain Broadsheet*, where the causal efficacy of the mind transpires rather clearly. The external objects, he writes:

...transmit something which, at exactly that moment, gives the mind occasion to form these ideas by means of the faculty innate to it (AT VIII B 359/CSM I 304)

²⁷ For a compelling rejection of an occasionalist reading of Descartes, see Nadler (1994). He reads Descartes as endorsing a species of occasionalism that he calls ‘occasional causation’, in which the agent that is triggered to act is a finite substance (the mind) instead of the infinite one (God). This reading certainly fits with Descartes’ use of ‘occasion’, but I think that it downplays Descartes’ effort for providing a description of what actually happens when the mind perceives/senses as a result of its interaction with a particular brain state. I elaborate on this view in Chapter Two.

I do not elaborate here on a specific causal model. For the textual purposes of this section, it has been sufficient to point out that the texts provide a picture of sensory perception in which the human brain and mind appear to be endowed with the configuration for a self-sufficient production of sensory ideas. In this regard, and additional support, consider the following extract from the *Treatise on Man*. There, Descartes seems to be suggesting that God already creates the brain and the mind with the necessary equipment ('will make its nature') for being able to sense:

When God unites a rational soul to this machine, as I intend to explain later on, He will place its principal seat in the brain and *will make its nature* such that the soul will have different sensations depending on the different ways in which the nerves open the entrances to the pores in the internal surface of the brain (AT X 143/G 119, emphasis added)

Certainly, God's ordination ultimately enters the picture, but not for ensuring the actual production process of sensory ideas. Rather, God's role is located in a more fundamental plane. God appears to give to correspondences between physical and mental states their *necessary* nature.²⁸ I believe that in Descartes' descriptions of sensory perception one can read an attempt to postpone the appeal to God's ordination as long as possible in order to emphasise the self-sufficiency of the production of sensory ideas. God makes an appearance in Descartes' model of sensory perception for dealing with the threat of arbitrariness. To this effect, in the *Optics* and the *Passions*, Descartes resorts to the notion of the 'ordination of nature' for explaining the occurrence of sensory perception (Op AT VI 130/CSM I 167, similarly in PS I 36, AT XI 357/CSM I 342).

All in all, I think it is difficult to defend the claim that the brain-mind transaction in sensory perception amounts to a denial of causation. It is being described as stimulation, excitation, sign giving, occasioning, acting, and making, and an explicit denial of causation is nowhere to be found in the texts. Note that the importance of the absence of such denial is also assisted by the passages advanced in the preliminary section about substance interaction as a whole,

²⁸ I focus on this issue in Chapter Two, in the context of analysing Descartes' argument for natural signs.

where we saw a Descartes concerned about the different workings of two processes (body-body and body-mind interaction) that he equally characterised in terms of ‘action’.

CONCLUDING REMARKS

In this first chapter, I have provided a textual platform for a causal reading of sensory perception that leaves some room for the causal efficacy of the mind. I started by presenting the problem of dissimilarity between physical and mental states as the refined version of the mind-body problem that Descartes is concerned about. Dissimilarity between the physical causes and the representational content of sensory ideas is precisely Descartes’ primary motivation for contemplating a different type of causation for brain-mind interaction.

To this effect, I have offered evidence of a terminological equilibrium in Descartes’ depictions of brain-mind interaction that sometimes has been overlooked in English translations of his works. It cannot be denied that Descartes did not employ the same terminology throughout. At the same time, however, this is not equivalent to the claim that his choice of terms is erratic or that it shows little more than hesitation about the theory of sensory perception. Finally, I have singled out a few initial implications of a reading of sensory perception along the lines of a peculiar, non-efficient type of cause. Two stand out amongst them. The first is Descartes’ patent effort in describing sensory perception as a self-sufficient process grounded on the powers of the human brain and the human brain. The second is the possibility of the causal activity of the mind in sensory perception. Considering these points, I move on to Chapter Two, where I will contend that this peculiar cause, that Descartes suggests, is better understood within a semantic model for sensory perception.

CHAPTER 2

BRAIN STATES AS NATURAL SIGNS

TOWARDS A SEMANTIC MODEL FOR SENSORY PERCEPTION

0. INTRODUCTION

In Chapter 1, we looked at an overarching characterisation of the interaction between the brain and the mind that constitutes sensory perception. According to this characterisation, the action of the brain upon the mind can be described as a causal transaction of a peculiar kind. This means that, for Descartes, the cause operating in brain-mind interaction, while being equally genuine, is not of the same type as the efficient cause operating in interactions between bodies. I have defended the position that the careful terminology that Descartes employs for describing brain-mind interaction does not indicate a denial of genuine causal efficacy, but it rather points to a complex model of sensory perception in which the mind has a significant role. I have also identified the Problem of Dissimilarity (PD) as the key motivation for the formulation of this model. Taking these points into consideration, now it is time to supply the materials for furnishing this conceptual frame.

The aim of this chapter is to put forward a model for sensory perception that has received the name of ‘semantic’ or ‘linguistic’ (Marion 1981, Yolton 1984, 2000, Gaukroger 1995,

2002, Chignell 2009)¹. I argue for the claim that, despite the fact that Descartes did not offer a comprehensive, unequivocal treatment of a single theory of sensory perception, the semantic model is his favoured solution to the (PD), as well as the closest that he got to formulating a fully-fledged doctrine.

As an initial formulation, we can say that, in the Cartesian context, a semantic model describes the process of sensory perception as a triadic relation between object, brain, and mind. Recall that, within Descartes' mechanistic physiology, a pattern of the geometrically reduced properties of the objects of sensory perception is transmitted through the nerves to the internal cavities of the brain, where a structural representation (*i.e.* an isomorph) is formed. In a semantic model, this structural representation is understood as a *sign* of the external object, which is then considered the *referent*, or *significatum*. Then, the structural representation in the brain signifies something other than itself (the external object), while also having a signifying role for the mind. This role is to operate as an occasion for prompting the mind's own activity. As a result, the mind acts as an *interpreter*, and the outcome of this activity is a sensory idea, which then counts as an effect of the mind's own causal efficacy. Amongst other explanatory advantages (that I will present in the upcoming sections), note that a crucial feature of this model is that the phenomenon of dissimilarity, which is one of Descartes' chief concerns, is built into the theory in a rather natural, fitting way. By means of dissimilarity is, precisely, how signs successfully signify things. This formulation of the semantic model will be unpacked throughout the chapter.

One might wonder, at this point, where the textual basis for a semantic model comes from in the texts. The main source to consider is the *Treatise on Light*, where Descartes identifies brain states with 'natural signs' or 'signs instituted by Nature' (AT XI 4/G 4). Further direct and indirect textual support also comes from the *Treatise on Man*, the *Optics*, the *Meditations*, and some of his correspondence, as we shall see. Right after the opening statement of the *Treatise on Light* ("The difference between our sensations and the things

¹ These authors have held, from different perspectives, readings that favour a semantic model. Other commentators have referred to a semantic model while objecting to it. In §1 of the present chapter I will offer the details of these interpretations.

that produce them', AT XI 3/G 3), Descartes contends, against a standard Scholastic theory of sensory perception, that similarity between external objects and ideas is not a necessary requirement for the perception of those objects. Initially, he illustrates this by means of an ordinary example concerning language. His point is that, despite the fact that conventional signs such as words do not resemble the things that they signify, they have the capacity to successfully make us think of their appropriate referents (*ibid.* 4/3). It is on the basis of this example that Descartes then mounts a crucial question: could nature be operating in a similar way? He puts it as thus:

Now if words, which signify something only through human convention, are sufficient to make us think of things to which they bear no resemblance, why could not Nature also have established some sign which would make us have the sensation of light, even if that sign had in it nothing that resembled this sensation? (*ibid.* 4/4).

The weight of this question within Descartes' theory of sensory perception is a matter of discussion. Some commentators have been inclined to downplay its metaphysical import given that it appears in the context of an analogy (De Rosa 2010, Clarke 2003, Bennett 2001, Wilson 1991). In this chapter I join the opposite side of the debate. I contend that Descartes' allusion to natural signs (in the *Treatise on Light* and elsewhere, and together with further interpretative support) should not be considered either as *just* an analogy, or as a one-off textual incident. On the contrary, I believe that it provides materials for reconstructing a cogent causal model for sensory perception and that it reveals fundamental features of how Descartes envisaged the interaction between the brain and the mind. One of these features, so I will argue, is a non-trivial sense in which the mind is not passive within the process of sensory perception.

In this chapter, my argumentation will proceed in four stages. In §1, I review the state of the question. The topic of natural signs in Descartes has not received as much attention as other aspects of his work, but it has nevertheless created an interesting area of connection between the Francophone and the Anglophone scholarships. I present an overview of the different treatments of the topic while indicating where my reading stands amongst these.

In §2, I reconstruct Descartes' taxonomy of signs. It is significant, for the purposes of the line of argument presented, that Descartes refers to the notion of sign in other contexts throughout his works. He uses the category of 'external signs' for explaining the external movements of the passions (PS XI 411,478/CSM I 367, 399), as well as the category of 'conventional signs' (that is, words and letters) for unfolding his theory of language (TL XI 4/G 4, DM AT VI 56/CSM I 139). All in all, I intend to show that a semantic narrative is not foreign to Descartes' explanations.

After presenting the taxonomy, I focus, in §3, on the scheme underlying natural signs (*i.e.* what fulfils the roles of sign, referent, interpreter, and outcome in the Cartesian picture). Descartes' knowledge and use (even if modified) of contemporaneous semantic accounts will constitute further grounds for the claim that, when introducing natural signs, Descartes is not offering a metaphorical remark about sensory perception, but a legitimate one that is meant to fit well with the rest of his system of philosophy.

Finally, in § 4, I develop the implications of a semantic model for sensory perception. This includes, on one hand, an assessment of the activity of the mind as interpreter of signs. The question becomes whether Descartes provided a theory (even if a minimal one) for understanding this peculiar sort of mental activity, and whether his system of philosophy can allow for it. On the other hand, I consider some explanatory advantages of the semantic model concerning the notion of natural ordination, as well as its integrative capacity for the varying terminology of the texts.

Overall, a semantic model for sensory perception will emerge as a consistent and plausible reading of Descartes in the sense of exhibiting the following explanatory advantages:² (a) it is directly supported by a number of texts *and* consistent with the majority of texts, (b) it is particularly integrative of disperse terminology, (c) it incorporates a notion (natural signs) that was not unusual at the time, and (d) it is, in tune with the goals of Cartesian natural philosophy, as much of a naturalistic explanation of sensory perception as it can be.

² An enumeration of explanatory advantages has been inspired by Chignell (2009).

SECTION 1. NATURAL SIGNS. STATE OF THE QUESTION

Some attention has been given, from different perspectives, to Descartes' introduction of natural signs as a strategy for explaining sensory perception given the (PD). However, a comprehensive treatment of the topic is almost non-existent. In this section I offer a short overview of the treatments of natural signs in the Cartesian scholarship while indicating where my interpretation stands amongst those.³

The topic of signs (natural and other) in Descartes has only recently gained some prominence in the Anglophone scholarship, while it has been present in the French scholarship for a few decades. Although her work is (somewhat surprisingly) not referred very often within the topic, no other than Geneviève Rodis-Lewis was, to my knowledge, the first contemporary philosopher to engage with the issue of signs in Descartes.⁴ In 'Le domaine propre de l'homme chez les cartésiens' (1964), Rodis-Lewis explores the distinction between human and non-human animals with the purpose of defending the originality of Cartesian anthropology as grounded on the substantial union of mind and body as a notion entirely intended by Descartes and crucial to his system. This means, for her, that the notion of the union is not an *ad hoc* addition to avoid the alleged consequence of splitting the human in two. Figuring predominantly within the doctrine of the union, we find the theory of sensory perception which, as she notes, 'is extended by a general theory of signs in which those of nature announce those which men institute in language' (1964:159, my translation).⁵ Although she insists on the analogical value of the theory, and her focus ultimately leans towards the signs of the passions and towards linguistic signs (as elements of Cartesian anthropology), her treatment has the merit of reconstructing, even if briefly,

³ Some of the points relevant to a semantic account will be only sketched here and developed properly in the upcoming sections of the chapter.

⁴ Her work is more commonly referenced for biographical remarks, given her renowned *Descartes. Biographie* (1995) and *Le Développement de la Pensée de Descartes* (1997).

⁵ The original reads: 'se prolonge par une théorie générale des signes où ceux de la nature annoncent ceux que l'homme institue dans le langage' (1964:159). Hereafter, and except when stated otherwise, translations of French secondary literature are mine.

Descartes' taxonomy of signs. She also identifies the introduction of natural signs (even if as an analogy) as a strategy for explaining dissimilarity, and not substance heterogeneity *as such*: 'natural signs correspond, then, both to feelings or sensations, and to the external manifestations of the passions; and the emphasis is on the dissimilarity between the mechanical excitation and its effect on us' (1964:159).⁶

Also within the French scholarship, Jean-Luc Marion provides an example of a complex interpretation of Descartes on signs, albeit one that extends ultimately in a direction that does not fall under the scope of this dissertation. Briefly, in *La théologie blanche de Descartes* (1981), Marion elaborates on the notion of 'code' as underpinning the whole of Descartes' metaphysics, of which a semantic interpretation of sensory perception is just an aspect. Fundamentally, the objective of Marion's reading is to show the weight of the theory of the creation of eternal truths in Descartes' system, and how an essential part in their discovery is a two-step movement of the intellect that he articulates through the notion of our interpretation of a code. Marion calls this the process of *figuration* and *(dé)-figuration*, referring roughly to the construction and deconstruction (dis-figuration) of figures (from the expression *verae figurae* that Descartes employs in Rule XII referring to the true nature of objects).⁷ The activity of *(dé)-figuration* consists of a further interpretative activity beyond the first decoding (*figuration*) of the qualitative character of our perceptual experience into the notions of mathematics. The human image of the world, which is qualitatively different from the *verae figurae*, could be understood as a further coded version of something even more fundamental.⁸ Under this lens, perceptions are dis-figurations of the mathematical representation of truth, while being essential to the discovery of eternal truths.

⁶ 'Les signes naturels correspondent donc à la fois aux sentiments ou sensations, et aux manifestations extérieures des passions; et l'accent est mis sur la dissemblance entre l'excitation mécanique et son effet en nous' (*ibid.*).

⁷ R, AT X 423, translated as the 'true shapes of things' (CSM I 47).

⁸ Marion puts it as follows: 'If Nature decodes according to the same code that human science uses for coding, then the initial figures could become intelligible again as they are discovered and covered by the latter figures...' ('Si la Nature décode suivant le même code dont use la science humaine pour coder, alors les figures initiales pourront redevenir intelligibles à mesure que les découvriront et recouvriront les figures dernières...') (1981:254)

An in-depth examination of Marion's theory surpasses the aim of this project. Nevertheless, it is worth emphasising a couple points from his treatment of the process of sensory perception (even if in his view it ends up being subordinated to a further coding activity). Despite the difference in approach, these are aspects that will become relevant in my reading of Descartes. (1) First, one core notion within a semantic model for sensory perception is the notion of transmission of information, and Marion uses it to reject mere associationism as a way of understanding the causal story of Descartes' theory. Rather than 'needlessly disrupting the simplicity' of the theory (1981:254)⁹, the presence of a code (and thus a coding activity) is precisely what captures better Descartes' way of thinking about ideas and (I would add) the causal efficiency of the mind. I believe that this is, indeed, a crucial aspect of the Cartesian model, and I will assess it in the upcoming sections. (2) Second, it is relatively rare to find within the literature an account of Descartes' theory of sensory perception that endows the phenomenon of dissimilarity with such metaphysical import. Certainly, the qualitative character of our perceptual experience does not enter into the descriptions of physical science in the Cartesian picture, but it reveals, nonetheless, something truthful about the dual entity that is the human being.¹⁰

Moving on to the Anglophone debate, much of it has been prompted by the analysis of John Yolton in *Perceptual Acquaintance from Descartes to Reid* (1984). Yolton's approach is, from a methodological point of view, similar to the one I am taking. He starts with a brief reconstruction of the corporeal phase of sensory perception, and he goes on to examine a few textual occurrences that could support a non-metaphorical reading of natural signs. Yolton's thesis is that Descartes envisaged the interaction between brain and mind as a 'significatory', non-causal relation in which ideas of external objects are 'semantic responses' to physical motions (1984:19). In taking seriously the introduction of natural signs and the

⁹ 'Car unne objection s'impose (...) l'introduction du code perturbe inutilement la simplicité au bénéfice d'une instance encore confuse...' (1981:254).

¹⁰ Ultimately, for Marion, this is enabled by the 'semiotic unity' ('unité semiotique') between the sign and the thing signified. I am sympathetic to this aspect of Marion's reading, which is also connected with Rozemond's view (1999) about the rightful status of the qualitative character of sensory perceptions. With her emphasis on the problem of dissimilarity, she has also made a compelling case for its genuine space in Descartes' true ontology of reality. This topic will reappear in chapters Three and Four.

relevance of the (PD), Yolton's reading has the merit of showing in a compelling manner some of the finesse of Descartes' account of sensory perception. However, the interpretation displays a couple of misconceptions.

(1) The first one is his idea that a semantic model implies that the relation between the brain and the mind is not causal: 'we should pay special attention to Descartes' rejection of any causal relation between the physical activity of objects on our sense and the perceptual ideas in our minds (...) motion in body does not cause but it signifies our sensations' (1984:18, 25). It is not clear why Yolton thinks that these two relations exclude each other, and he gives no further explanation of his assumption. On one hand, Descartes' alleged rejection of a causal relation is nowhere in the texts. As we have seen in Chapter One, his terminology changes for the mental phase of sensory perception, but a rejection of causation is far from being the most plausible motivation. On the other hand, even intuitively at this stage, a sign could be considered as a type of cause, rather than as something entirely different from a cause, particularly given a sign's capacity for bringing about something different from itself (which could be labelled as an 'effect'). I will expand these issues in my own treatment of the topic in the sections to follow. At any rate, it does seem as if Yolton is making the same assumption as some of Descartes' interlocutors. Namely, it is *only* an efficient-transcendent cause that counts as a genuine cause.

(2) The second misconception that I notice in Yolton's analysis concerns the way in which he cashes out a difference between 'signifying' and 'representing' that he identifies in the Cartesian texts. If I have read Yolton correctly, he bases this distinction on a link between representation and similarity on one hand, and between signification and dissimilarity on the other (1984:30)¹¹. I find this division odd because the notion that a sign signifies something other than itself does not exclude, *a priori*, that it also represents it.¹² It might

¹¹ Yolton also concludes, rather cryptically, with a three-fold distinction between ways in which mind and body (brain and external objects) can be connected: by signification, by resemblance, or by causation. 'Mind and cognition are thus connected with the world, but the connection is precisely that which is proper to cognition: significatory, not resemblance or causal' (1984:30). It is not clear what are the differences between the three, and why they are mutually exclusive.

¹² For example, in general terms, a mental state is representational if it provides the mind some sort of information about something existing in extramental reality (Simmons 1999:347). Specific

not represent it by means of resemblance, but that appears to be Descartes' very point throughout the texts, figuring predominantly in his critique of the Aristotelian-Scholastic theory of sensory perception. Charitably, a distinction between signifying and representing could stand, but certainly not on the grounds of attributing dissimilarity to the former and similarity to the latter as a way of delineating their way of operating.

A similar objection has been made by David Behan (2000) in his commentary of Yolton's reading. Behan, as Yolton, takes for granted that a semantic reading excludes a causal reading. He does not, in any case, engage at length with the Cartesian theory. Rather, what is important about his response is that it provides historical and philosophical context for Descartes' appeal to natural signs. Behan shows that, upon Aristotelian and Augustinian influences,¹³ a complex theory of signs had been developed during medieval times. Descartes could have been drawing for his own theory on a late Scholastic distinction between 'formal' and 'instrumental' signs that was commonplace at the time (2000:528-9). I will come back to this possible influence on Descartes in my own treatment of signs.

Moving on to a different side of the discussion, in his extensive treatments of Descartes' natural philosophy, Gaukroger (2002, 1995) has devoted some attention to what he calls a 'linguistic model' of cognition emerging from the analogy between language and perception in the *Treatise on Light*. In this case the expression 'linguistic model' is to be understood as roughly equivalent to what the rest of commentators call a 'semantic model' *i.e.* a model for sensory perception in Descartes that is understood as an interpretative reaction by the mind to a certain brain state that operates as a sign of an external object.

Gaukroger claims that the appearance of natural signs marks a shift in focus in Descartes' theory of sensory perception. The shift, he argues, is from a pictorial theory of perception in

theories concerning the representational nature of mental states might argue from there, for example, whether this involves resemblance between the mental state and the extramental reality, or whether a successful tracking of the latter is sufficient for the mental state to count as representational. In any case, the point here is that a semantic characterisation of sensory perception does not provide *a priori* reasons for thinking that signification is non-representational.

¹³ For Aristotle, the work at stake is the *Posterior Analytics*, within the *Organon* (the *Logic*). For Augustine's work on signs, Behan refers to *De Dialectica* and to *De Doctrina Christiana*.

the *Rules* that focuses on solving the issue of how perceptual information is *conveyed*, to linguistic (non-pictorial) considerations that are intended at solving the issue of how perceptual information is *represented* (1995:284). A causal-mechanical approach, Gaukroger rightly states, is able to account for the physical processes that need to occur for perceptual cognition to take place, whereas a linguistic model attempts to capture what such perceptual cognition consists in (2000:207). He considers these as two ‘complementary levels of description’ (1995:286) and he expresses the shift as follows:

Simplifying somewhat, in the *Regulae* his account focuses on getting the ‘perceptual’ part of perceptual cognition right, whereas here (in *The World*) he concentrates on the ‘cognition’ side of the question. The account of cognition in the *Regulae* is little more than a mechanist reworking of medieval faculty psychology (...) The account presented in the first chapter of *Le Monde* is quite different. Perceptual cognition is not thought of in causal terms, and it is not thought of as a multi-stage process. Rather, the treatment focuses on the question of how we are able to respond to certain properties or events as information (Gaukroger 1995: 282, clarification added)

Briefly, I agree with Gaukroger in that there is a change of approach between the ‘faculty psychology’ of the *Rules* and the more sophisticated theory that appears in *The World*. I also agree with the main point that, for the purposes of a theory of perception, Descartes’ mechanistic physiology has the task of accounting in causal terms for transmission of information. Indeed, natural signs enter the picture when Descartes needs to describe the occurrence of the particular qualitative character of human sensory perception (that is, what it is for the mind to perceive something, not *how* the information gets there). In this respect, the mental phase of the process of sensory perception can certainly be labelled as a response to certain physical properties or events *as* informing us about the world. At the same time, however, I have a couple of reservations about Gaukroger’s assessment.

(1) First, the claim that ‘perceptual cognition is not thought of in causal terms’ (because of the introduction of natural signs) seems to stand on a rather ill-defined notion of causation. Charitably, Gaukroger elaborates on an interesting distinction between causation and signification on the basis that causes do not depend on our identification of them *as such* in order to operate as causes. Signs, on the other hand, require our ability to recognise them as

such in order to bring about an effect (2000:207). While this is an interesting point (and one that should be explored in itself independently)¹⁴, I believe that it misses, at least in the case of Descartes, the very point that he is trying to make about signs being precisely *natural*. In the Cartesian picture, what he calls ‘natural ordination’ ensures that certain signs will always be met with certain responses. The point of an analogy with linguistic signs is to provide information about a natural process that will operate in a similar way *with the necessary changes having been made*. Given the differences that will necessarily appear when the linguistic model makes us understand the workings of nature, to claim that signs are not causes because they depend on our recognition of them seems to fall into an equivocation of what it is to ‘recognise’ a sign when that sign is natural.

(2) Second, Gaukroger ultimately considers the formulation of natural signs as an analogy (1995:287). To be precise, he identifies it as an explanatory device that Descartes employs for shedding some light on what perceptual understanding consists in, given the limitations of a mechanical approach. Furthermore, in his reading, the motivation behind this explanatory device is to mark a distinction between ‘sentience and non-sentience’ that is, between perception in human and non-human animals (2000:207). I think that to limit the import of Descartes’ natural signs as that of an analogy is to downplay the scope of his theory (as I will show in the following sections). Most importantly, though, Gaukroger’s reading leaves an incredibly small amount of tasks for the mind to carry out, with the consequent mechanisation of the majority of the processes of human perception.¹⁵ For some of these, such as the case of colour perception, Gaukroger’s mechanisation relies on an identification of non-conscious processes with processes that can be fully accounted by the in-built capacities of the brain, and not of the mind (2000:208-9). In cases such as colour perception, I do not find in the texts grounds for this assumption.¹⁶

¹⁴ Such an examination goes beyond the purposes of this project. I am concerned here only with an overview of the literature that serves as a prelude to my own reading of Descartes on natural signs.

¹⁵ I am aware that this has become precisely Gaukroger’s well-known overall position on the Cartesian theory.

¹⁶ In Chapter Four I will explore at length the role of a distinction between primary and secondary qualities in Descartes’ theory of sensory perception. There, I examine, amongst others, the case of colour perception.

Let us now focus on one of the latest contributions to the discussion on Descartes and natural signs. To my knowledge, the only defence of a causal *and* semantic model for Descartes' theory of sensory perception has been offered by Andrew Chignell (2009) on the grounds of its having a number of theoretical advantages over rival interpretations. Amongst those, it is worth mentioning here a couple of them. (1) First, a causal and semantic model is able to combine under a single framework textual occurrences that would otherwise be seen as belonging to different theories for the interaction of brain and mind. In certain passages, Descartes speaks of the mind as 'attending' or 'inspecting' brain states, in others he describes the brain as 'presenting' or 'exhibiting' something to the mind, and he also refers to brain states as 'occasions' for the mind to produce ideas. These textual occurrences are well integrated within a causal-semantic model (which is, itself, also explicitly supported by the introduction of natural signs). For instance, within this model, the signifying role attributed to brain states makes them act as occasions for the interpretative activity of the mind without necessarily turning the theory into a strong occasionalist one (Chignell 2009:6-10). I will expand on this integrative ability of the causal-semantic model in my own treatment.

Closely connected to this advantage, the second one arises. (2) Chignell identifies (rightly, I believe) a policy behind Descartes' theory of sensory perception that he names 'qualified explanatory naturalism', and that fits well with the objectives that might be expected from a natural philosopher that champions mechanistic explanation like Descartes did. 'Qualified explanatory naturalism' is the 'policy of not resorting to supernaturalistic appeals until naturalistic explanations have been exhausted' (Chignell 2009:16). With the term 'supernaturalistic' Chignell is referring here to instances such as God's intermediary action in strong occasionalism, to the minimal explanatory power of brute associationism, and even to premature appeals to natural ordination. In other words, a causal-semantic model captures Descartes' effort to portray sensory perception as a process that is fully grounded on the powers and dispositions of the human brain and the human mind, and it does that by adding a further explanatory level that delays the introduction of natural (and divine, for

Descartes) ordination as much as possible within his system (2009:15). I will go back to this point later on.¹⁷

Finally, shorter, relatively favourable treatments of the semantic model include the ones by Wilson (1991) and Rozemond (1999). Wilson held a different proposal for the Cartesian model of sensory perception —what she calls the ‘presentation model’— and she reads the appearance of natural signs as an analogy used in order to establish the point of the lack of resemblance between the brain state and the idea (1991:296). Tad Schmaltz (1997) has also followed this diagnosis overall. Despite offering a different interpretation, Wilson does remark, directly against readings such as Yolton’s (1984), that the sign terminology could be incorporated as subordinated to the presentation model without preventing a causal reading of brain-mind interaction. Rozemond has taken an initially similar interpretative route in denying that the allusion to natural signs should count as an anomaly or a ‘harmless *façon de parler*’ (1999:466). In her reading, she takes seriously Descartes’ introduction of natural signs in the sense that it reveals some features of just one aspect of the theory of sensory perception. Namely, it captures the fact that brain states have a causal role in the production of ideas insofar as they explain their occurrence, while the mind counts as the source of the representational content of those ideas (*ibid.* 463). This means, for Rozemond, that talking about signs clarifies one aspect of Descartes’ causal story but, all in all, it cannot stand as a wholesale model for sensory perception. She claims that the texts point to a broader ‘complex model’ of which natural signs are partial manifestation, and she declares that the notion of natural signs cannot deal properly with certain objections (*ibid.* 464-6). Now, while I consider Rozemond’s reconstruction of the causal story of brain-mind interaction the most plausible, I disagree with her claims about the semantic model not informing us about other features of the theory, as I intend to show.

¹⁷ Chignell’s is an extremely clear proposal that also includes a brief analysis of types of causes as well as a good collection of textual evidence for a non-metaphorical reading of the introduction of natural signs. He eventually fails to acknowledge some significant textual occurrences in *The World* (he claims, for instance, that the talk of ‘occasions’ belongs only to later works), and he does not provide the context of Descartes’ taxonomy of signs, which I take to be crucial for increasing the plausibility of the model. As I will explain in what follows, the fact that Descartes held, as a matter of fact, a theory of signs as an explanation for other phenomena (conventional signs for language and external signs for the passions) could make us think that the third type of signs (natural signs) is to be taken as seriously (non-metaphorically) as the other two.

To my knowledge, a meticulous, charitable rejection of the semantic model has not been offered in any of the literature. The potential significance of natural signs is often ignored altogether, and sometimes it is simply dismissed with extraordinary brevity. For instance, Bennett (2001:107) settles the matter by declaring that Descartes ‘has little if any theory’ about ‘how ideas represent things outside us’, and that seeing natural signs as assisting in that task is ‘overloading the text’. He gives no further grounds for this statement. In her monograph on Descartes and sensory representation, De Rosa (2010:176-7) simply takes the passage in the *Optics* in which Descartes ridicules the view that the mind inspects the brain ‘as if there were yet other eyes within our brain’ (AT VI 130/CSM I 167) to be sufficient evidence for ruling out a semantic model.

All in all, I believe that dismissals of the semantic model have been too rushed, especially given the peculiarity of a notion such as natural signs. As I see it, its peculiarity should at least make us think twice about the potential for such a model. Why would Descartes allude to such an intriguing notion (a notion, as we shall see, with a rather stable meaning in the period) without telling us that it is meant as a literary recourse? In the following pages, I delve into the semantic model as a genuine possibility. I will start with a reconstruction of Descartes’ taxonomy of signs for the purpose of showing that a semantic narrative was not foreign to Descartes’ thought.

SECTION 2. A TAXONOMY OF SIGNS

Descartes did not devote a specific work to develop a comprehensive doctrine of semiotics, but he did make use of the notion of sign in order to describe three phenomena: language, the external movements of the passions, and sensory perception. For these purposes, he appealed to conventional, external, and natural signs respectively, although only the last ones are often taken simply as metaphorical talk. In this section I start with a brief reconstruction of Descartes’ taxonomy of signs. The objective of this reconstruction is to establish a useful comparison between types of signs for understanding how Descartes

conceived semantic relations and the motivations that he had for bringing them into play. After presenting the taxonomy, I will provide a more in-depth analysis of natural signs.

2.1. CONVENTIONAL SIGNS

Let us begin with conventional signs. As the term itself indicates, these are signs that denote certain other things by means of human convention. For Descartes, the paradigmatic example of a system of conventional signs is language. He did not write extensively about language, but a rather clear doctrine transpires from Part 5 of the *Discourse*, from remarks in the *Treatise on Light*, and from his correspondence. Admittedly, the absence of an extensive treatment of language can at least be partially explained by the philosophical context of that time. The Aristotelian-Scholastic tradition to which Descartes was reacting relied heavily on language. Medieval philosophy was often dependent on questions of linguistic meaning and discussed through the framework of logic (Maat 2011:273). Although the notions and methods of Scholastic philosophy permeated well into the seventeenth century (it was, as we know, the tradition in which Descartes himself was educated by the Jesuits at La Flèche and a source of concepts for his philosophy), a number of diverse responses to it also started to emerge at the time, in tune with the reforming goals of the natural philosophers at the turn of the century.¹⁸ Amongst them, Descartes championed the view that the pure ideas of the mind do not need language and that, consequently, language is subordinated to thought and

¹⁸ Authors as diverse in their philosophical standpoints as Bacon, Descartes, Hobbes, Spinoza, and Locke voiced, for instance, how language can have a pernicious effect on thinking (Maat 2011:273). In the philosophical context of that time, language became progressively subordinated to thought. For Descartes' view on this particular 'source of error', see *Principles* IV 197 (AT VIII A 320-21/CSM I 284). On a similar note, Descartes' criticism of traditional (Aristotelian-Scholastic) logic and method in general figures already in the *Rules*: 'Our principal concern here is thus to guard against our reason's taking a holiday while we are investigating the truth about some issue (...) to make it even clearer that the aforementioned art of reasoning contributes nothing whatever to knowledge of the truth, we should realise that, on the basis of their method, dialecticians are unable to formulate a syllogism with a true conclusion unless they are already in possession of the substance of the conclusion, *i.e.* unless they have previous knowledge of the very truth deduced in the syllogism. It is obvious therefore that they themselves can learn nothing new from such forms of reasoning, and hence that ordinary dialectic is of no use whatever to those who wish to investigate the truth of things' (R, AT X 406/CSM I 36-7)

it is relevant only for the need for communication.¹⁹ This position can be seen as a natural product of the Cartesian thesis regarding the obscurity and confusion attributed to the senses. The problem then, is that the ordinary meanings of words have assimilated the wrong opinions that are formed particularly during childhood.²⁰ As Clarke puts it, ‘human language is fundamentally compromised by the lack of the clarity and distinctness of the senses. The unique path to scientific knowledge, on his account, requires the purification or turning away from the senses that is recommended in the *Meditations*’ (2003:159). As mentioned above, Descartes’ treatment of language is often developed through the notion of conventional signs. It revolves around two main points that will help us in understanding his account of signification:

First, for the case of conventional signs, Descartes puts forward what we could call a ‘nominalist stance’. This means that there is no intrinsic, natural connection between a word (the sign) and its significatum (the thing it signifies): ‘when I see the sky or the earth, this does not oblige me to name them in one way rather than another, and I believe that it would be the same even if we were in the state of original justice’ (To Mersenne, 18th December 1629, AT I 103).²¹ In a system of conventional signs, this type of (human-made) arbitrariness is accompanied by dissimilarity between the sign and the significatum. This is, for Descartes, the hallmark of semantic relations, namely, that despite the fact that there might be dissimilarity between the two (as there is in the vast majority of these cases), our

¹⁹ This idea became well-known and specifically a mark of the Cartesian doctrine through the Port-Royal Logic (Antoine Arnauld’s and Pierre Nicole’s *Logic or the Art of Thinking*).

²⁰ In the *Principles*, for instance, Descartes cautions against the focus on ordinary words rather than the things that they are meant to signify. He identifies this as the ‘fourth cause of error’ concerning the judgments that we make about objects of sensory perception: ‘Because of the use of language, we tie all our concepts to the words used to express them; and when we store the concepts in our memory we always simultaneously store the corresponding words. Later on we find the words easier to recall than the things; and because of this it is very seldom that our concept of a thing is so distinct that we can separate it totally from our concept of the words involved. The thoughts of almost all people are more concerned with words than with things...’ (Pr I 74, VIIIA 37-8/CSMK I 220).

²¹ This is my translation, given that this part of the letter is not included in the CSMK edition. The original reads: ‘Mais lorsque je vois le ciel ou la terre, cela ne m’oblige point à les nommer plutôt d’une façon que d’une autre, et je crois que ce serait le même, encore que nous eussions la justice originelle’. ‘Original justice’ refers here to the paradigmatic state of innocence (and lack of experience of the world): the ‘Adamic’ innocence before the committing of the Original Sin.

thought is consistently compelled to form an idea of the significatum. In other words, this means that, *even* if there was similarity between sign and significatum, that fact would not play a part in bringing about the appropriate idea in our mind. As we shall see, this is what makes the analogy between words and brain states in the *Treatise on Light* such a pertinent one.

Recall at this point the first chapter of the *Treatise on Light*: ‘words, which signify something only through human convention, are sufficient to make us think of things to which they bear no resemblance’ (AT XI 4/G 4). This suggests a straightforward scheme, in which words (and letters in turn) are ‘signs’, the object (broadly conceived) that those words refer to is the ‘significatum’, the human being is the ‘interpreter’ of the relation between the two, and an idea of the significatum the is the ‘outcome’ of the process.

Second, Descartes sees the creation and interpretation of the conventional signs that constitute language as that which sets apart human from non-human animals. His most extended treatment of the topic of semiotics is to be found precisely in his analysis of the human capacity for what he calls a ‘meaningful’ use of language (DM AT VI 57/CSM I 140). This is connected to Descartes’ views on the limitations of mechanistic physiology. In contemporary terms, this would be a matter of whether neural mechanisms are capable of generating all the responses and have sufficient complexity to capture linguistic behaviour (Cottingham 1993:105). In the Cartesian picture, the semantic relation realized in the case of language is not the kind of phenomenon that can be captured by arrangement and motion of micro-particles of matter. In other words, it is the type of phenomenon that requires a mind.²²

²² Cottingham (1993:120) expresses it as thus, maintaining the focus on the notion of sign: ‘the gap between the sign and the significatum is not of the kind that can be bridged by the causal laws of physics’. Descartes dualism has been sometimes considered, particularly from the viewpoint of contemporary philosophy, as immature or ill-justified, and it is interesting to observe how not only the Problem of Dissimilarity, but also his considerations about the genuine use of language provide rather sophisticated material for a dualist standpoint. Here, his argument for dualism (spelled out in this case as the essential difference between animals and non-human animals) can certainly be seen as a precedent of the argument that Leibniz puts forward concerning (partly) the limitations of mechanistic/materialist explanation in the *Monadology* and elsewhere, and that is commonly referred to as ‘Leibniz’s Mill’ (M17). Of course, Leibniz’s account of the limitations of mechanism has a

Descartes is aware that, as a matter of fact, non-human animals do employ language in several ways. In order to deal with such occurrence, he distinguishes between a meaningful and a meaningless use of language. In Part 5 of the *Discourse*, he devises a thought experiment for establishing this distinction. If there were some sort of machines (a type of automaton) that ‘bore resemblance to our bodies and imitated our actions as closely as possible’ (AT VI 56/CSM I 139), we could still assert that they are not human beings (beings with a mind) in two ways. First, those machines would utter words, but those words would not be used in any meaningful way. Second, they would eventually fail in performing linguistic acts, thus revealing that the semantic relations that they seemed to be employing were a result of entirely physical stimulus-response mechanisms.²³ Insofar as it requires a mind, a meaningful use of conventional signs is then essentially different from a meaningless one, even though their external manifestations could be equivalent.²⁴ Note that the machines figuring in the thought experiment are, no doubt, equivalent to non-human animals for Descartes: ‘we see that magpies and parrots can utter words as we do, and yet they cannot speak as we do: that is, they cannot show that they are thinking what they are saying’ (*ibid.* 57/140). While some non-human animals are able to mimic human speech, the distinctive feature of a meaningful use of language is ‘the intentional aspect of semantic competence’ (Di Bella 2015:437). In other words, it is the capacity of the human being — as stemming from the versatility of reason— for using *interpreted* conventional signs.²⁵

further, different aim than Descartes’, which is to show that perception can only be explained by the presence of a simple substance.

²³ ‘For we can certainly conceive of a machine so constructed that it utters words, and even utters words which correspond to bodily actions causing a change in its organs (e.g. if you touch it in one spot it asks what you want of it, if you touch it in another it cries out that you are hurting it, and so on). But it is not conceivable that such a machine should produce different arrangements of words so as to give an appropriately meaningful answer to whatever is said in its presence, as the dullest of men can do. Secondly, even though such machines might do some things as well as we do them, or perhaps even better, they would inevitably fail in others, which would reveal that they were acting not through understanding but only from the disposition of their organs’ (DM, AT VI 56-7/CSM I 140)

²⁴ Maat (2011:288) has appropriately described Descartes’ thought experiment as a ‘reverse Turing test’.

²⁵ Descartes restates his view rather clearly in his correspondence with the Marquess of Newcastle: ‘I cannot share the opinion of Montaigne and others who attribute understanding or thought to

For accomplishing this task, Descartes summons ‘intellectual memory’, a type of memory that is exclusive to humans. He establishes a distinction between ‘corporeal’ and ‘intellectual’ memory and, although a detailed assessment of the distinction cannot be provided here, for the purposes of this project it is at least worth clarifying that corporeal memory is shared by human and non-human animals and is entirely dependent on brain states (it is useful, for instance, for learning about threats to survival, such as the presence of a predator). On the contrary, intellectual memory is a power exclusive to the mind and it is associated with concept recognition.²⁶ It makes sense, then, that Descartes attributes the meaningful use of language to the intellectual memory, which stores meanings of conventional signs and realizes the interpretation of the significatum on the basis of them.²⁷

Note briefly, at this point, that a meaningful use of conventional signs seems to involve a purely mental activity that is not necessarily carried out consciously. Certainly, the mind needs to be familiarised with the conventional correspondences between certain words and their referents in order to interpret them successfully. However, this is not the same as stating that the mind needs to be aware of those correspondences at all times, not even when they are being employed. This is no other than the knotty issue of the transparency of the

animals (...) In fact, none of our external actions can show anyone who examines them that our body is not just a self-moving machine but contains a soul with thoughts, with the exception of spoken words, or other signs that have reference to particular topics without expressing any passion (...) This seems to me a very strong argument to prove that the reason why animals do not speak as we do is not that they lack the organs but that they have no thoughts’ (23rd November 1646, AT IV 573-75/CSMK 302-3).

²⁶ Descartes expresses this succinctly in a letter to Mersenne: ‘But besides this memory, which depends on the body, I believe there is also another one, entirely intellectual, which depends on the soul alone’ (1st April 1640, AT III 48/CSMK 146).

²⁷ This is covered in the *Conversation with Burman*: ‘When, for example, hearing that the word ‘K-I-N-G’ (R-E-X) signifies supreme power, I commit this to my memory and then subsequently recall the meaning by means of my memory, it must be the intellectual memory that makes this possible. For there is certainly no relationship between the four letters (K-I-N-G) and their meaning, which would enable me to derive the meaning from the letters. It is the intellectual memory that enables me to recall what the letters stand for’ (AT V 150/CSMK 336-7 Latin clarification added). It should be noted that, although the *Conversation with Burman* does not present the kind of inconsistencies that would make commentators sceptical about its value, it is in a way a less authoritative source. It consists of the notes that Frans Burman took of a conversation with Descartes in 1648.

mind in Descartes (that is, the alleged Cartesian thesis that the mind is aware of all its contents).

2.2. EXTERNAL SIGNS

After having presented Descartes' account of conventional signs, let us move on to external signs, which are the 'signs of the passions' (PS II 112, III 200, AT XI 411, 478/CSM I 367, 399). In Cartesian language (and in general, in early modern vocabulary) 'passions' refer broadly to what nowadays we catalogue as emotions. As coming from the Latin *passio* —a rendering of the ancient Greek *πάθος* (*pathos*)— the notion of 'passion' was contrasted with that of 'action'. While the former refers to the mind's passivity in receiving certain inputs from the body, the latter captures the mental operations that are initiated by the faculty of the will. Descartes call the latter 'volitions'. What we find in the *Passions*, then, is an exhaustive taxonomy of the kind of actions of the body upon the mind that we call emotions. He identifies six fundamental kinds of passions (wonder, love, hatred, desire, joy, and sadness), while the rest are 'composed from some of these six or they are species of them' (*ibid.* II 69, 380/353). A key feature of this account is the degree to which, for Descartes, emotions are dependent on physiological states and responses. He devotes a significant part of the *Passions* to draw detailed explanations of the changes in the circulatory and nervous system that explain the occurrence of each emotion.²⁸

The signs of the passions are called 'external' due to the distinction that Descartes makes between the 'internal' and 'external' movements of the passions as the two corporeal manifestations of a passion in the soul. Interestingly, this classification figures already within

²⁸ For instance, these are excerpts of his descriptions of the physiological changes that bring about sadness and joy in the mind: 'In sadness, by contrast, the openings in the heart are severely restricted by the small nerve with surrounds them, and the blood in the veins is not agitated at all, so that very little of it goes to the heart' (PS II 105, AT XI 406/CSM I 365). 'It has also happened at the beginning of our life that the blood contained in the veins was quite suitable for nourishing and maintaining the heat of the heart (...) this produced the passion of joy in the soul. At the same time it caused the orifices of the heart to be opened wider than usual; and it made the spirits flow abundantly from the brain...' (*ibid.* II 109, 409/366).

the anatomical studies in *Treatise on Man* (AT XI 193-4/G 163-4), written (though not published) approximately seventeen years before the *Passions*. For instance, in the case of one of the ways in which the passion of joy occurs, the internal movements would correspond (in the Cartesian theory) to an abundant flow of animal spirits from the brain into those nerves which have the function of opening the orifices of the heart (PS II 109, AT XI 409/CSM I 366). The external movements of passions can be diverse, and they correspond to their external visible expression. These are what Descartes calls external signs of the passions. In the case of joy, its external signs would be, for instance, laughter and/or blushing (*ibid.* II 115, 126, 413/368, 420/371). The external movements of the passions are called ‘signs’, then, insofar as they signify, or ‘bear witness to’ (‘témoignent’) the passions (TM, AT XI 193/G 163).

As we have seen above in the case of conventional signs, the semantic scheme that Descartes offers here is also rather straightforward. The external expression of the passion is the sign, and the passion in the soul is the significatum. The interpreter of this correspondence is, again, the human being, and the result of interpreting a given sign is the creation of an idea of the significatum. Upon observing laughter in a friend, for instance, one goes beyond this physical manifestation as such and interprets, all things considered, the presence of joy.

I have added the qualification ‘all things considered’ because it seems to be peculiar to external signs that they exhibit what we would call, in contemporary terms, ‘multiple realizability’ about the mental (in short, the thesis that a single mental state can be realized by a diversity of physical states).²⁹ This fits well with two facts in the Cartesian account of the passions. On one hand, passions in the soul exhibit multiple realizability because a single passion can be produced by a variety of physical processes and thus can be manifested through a variety of external signs. For example, Descartes gives two slightly different accounts of the causes of joy (PS II 104, 109, AT XI 405, 409/CSM I 364, 366). On the other hand, (and looking at the process from the opposite direction), external signs can also

²⁹ The current debate on multiple realizability encompasses many nuances that are not discussed here (Bickle 2013). For the purposes of clarifying Descartes’ theory of external signs (and of signs in general, as we shall see), I simply provide a standard, working definition of the concept.

signify a plurality of passions. Laughter can signify joy, but also perhaps nervousness, and even indignation (*ibid.* II 127, 421-2/372). A treatment of these phenomena can also be found in his correspondence with Elizabeth of Bohemia. She was the one to ask Descartes for a lengthier treatment of the passions after their exchange on the issue. It is not casual, then, that the topic of the external signs of the passions is foreshadowed in some of those letters. He writes to Elizabeth:

Flushing of the face does not always come from shame, but it can also come from the heat of the fire, or even because one is exercising. The laughter called sardonic is nothing else but a convulsion of the nerves of the face. Similarly, one can sigh sometimes from custom, or from a malady, but this does not prevent sighs from being *exterior signs* of sadness or of desire, when passions cause them (May 1646, AT IV 410/S 136 emphasis added).

Finally, there is something else worthy of mention within Descartes' treatment of the passions —namely, that while a restricted meaning of the notion of passion referring only to the corporeal process is also attributed to non-human animals, the allusion to external signs only occurs when the human being enters the picture. This is certainly not a coincidence. The notion of signs is textually confined to human passions because it is meant to provide, as we have seen before, an intelligible story for the correlation between physical and mental states. In this case, external signs capture the dissimilarity between the visible expression of a physiological state and the resulting mental state that is the passion. In other words, we can see, in the case of external signs, how the notion appears again for explaining a fundamental phenomenon of dissimilarity that is unique to the very nature of embodied minds.

2.3. TAXONOMY OF SIGNS: COROLLARY

To conclude this section, let us summarise three significant points that this analysis of conventional and external signs has revealed about Descartes' views on semantic relations.

(1) First, for both conventional and external signs, he puts forward a scheme with the same components: a sign, a significatum, and an interpreter of the relation between the two. This interpretative activity brings about an idea of the significatum in the mind of the interpreter.

We are presented, thus, with equivalent processes. For example, I read the word ‘oak’, which signifies a type of tree, and upon interpreting this correlation (what the letters o-a-k stand for), an idea is formed in the mind. If my knowledge of the correlation is appropriate, the content of this idea will be of a tree with green lobed leaves, perhaps brimming with acorns. Similarly, knowing that crying (and the internal, physiological changes associated with it, if one could access them on an ordinary basis) often signifies sadness, the idea of sadness is brought about in the mind upon seeing a tearful face.

(2) Second, it is important to observe that a successful interpretation of the correlation between a sign and a significatum is, at least *in principle*, possible without any conscious activity of the mind. Certainly, success in the interpretation of signs requires knowledge of the correlations (what one could also call knowledge of a ‘code’). The acquisition of this knowledge can be a fully conscious activity —think, for instance, of an adult learning a new language (*i.e.* a new system of conventional signs). The activity of decoding, however, need not be conscious. Furthermore, it seems that, at least intuitively at this point, a feature that contributes to the success of the semantic relations that we have looked at is the fact that they are stored and recalled with precision in an unintentional and instantaneous manner. Consider, for the moment, how the operation is described for conventional signs: ‘the fact that words often bear no resemblance to the things that they signify does not prevent them from causing us to conceive those things, *often without our paying attention to the sounds of the words or to their syllables*’ (TL AT XI 4/G 3-4 emphasis added).

(3) Third, a further shared feature of conventional and external signs is that they deal with instances of dissimilarity. Both for the case of language or for that of the passions, signs are invoked as a way of explaining the etiology of processes that are characterised by the fundamental dissimilarity between the mechanical explanations of the physical world, and the qualitative nature of mental states. Recall, as a paradigmatic instance, that Descartes makes linguistic competence (that is, ‘meaningful’ use of conventional signs) the ultimate evidence for the presence of a mind.

In conclusion, I believe that the identification of common features of different signs can assist us in making sense of Descartes’ reason for employing semantic terminology across the

board. Taking these points into consideration, I move on to examine the third component of this taxonomy: natural signs. In the upcoming sections, natural signs will appear as proper members of Descartes' taxonomy of signs, and in agreement with his semantic narrative. This will counter interpretations that have deemed the appeal to natural signs as a figure of speech (Wilson 1991, Gaukroger 1995) or that consider the causal-semantic model over-speculative (Bennett 2001, De Rosa 2010).

SECTION 3. NATURAL SIGNS IN CONTEXT

In this section I examine the notion of natural signs, thus completing the picture of the Cartesian taxonomy of signs. Simply put, natural signs are those that appear in semantic relations established by natural ordination. Like other types of signs, a natural sign is also dissimilar from the thing it signifies (its significatum), but it is related to it in a non-conventional way: in a *natural* way. Descartes makes use of natural signs (and natural signification) for describing the process of sensory perception. Regardless of whether one considers this notion a metaphor or a legitimate metaphysical concept, natural signs are identified in the texts with brain states, and they have the role of explaining the dissimilarity between external objects and ideas in the mind. That is to say, they are meant to make sense of the Problem of Dissimilarity (PD).

In order to understand in more depth what are natural signs, what function do they have, and how they exercise it, we need to look at the texts. In what follows, I investigate the textual occurrences of natural signs and I reconstruct the scheme that underlies their operation (*i.e.* what fulfils the role of sign, significatum, interpreter, and outcome). An initial goal of this analysis is to show that Descartes' introduction of natural signs is not to be deemed as metaphorical talk, nor as a one-off random textual occurrence. I believe that, after having determined the presence of a stable position by Descartes on conventional and external signs, as well as his motivations for employing them, one should be prepared to concede that the genuine allusion to a third type of sign is a serious possibility. Natural signs, so I contend, preserve a semantic narrative that is not foreign to Descartes' thought.

3.1. NATURAL SIGNS IN THE *TREATISE ON LIGHT*

Let us begin with the analysis of the relevant passages. We are already familiar with the first one —it constitutes the opening paragraph of the *Treatise on Light*, and it introduces the lengthiest explicit description of natural signs. In it, Descartes offers an analogy with conventional signs that runs schematically as follows: even though they rely on human convention, conventional signs (such as words) are capable of directing our thought efficiently towards the things that they signify, to which they are entirely dissimilar. Upon this statement, a question emerges: could nature be operating in a similar way when it comes to sensory perception? This is the passage in question:

Passage (A)

Now if words, which signify something only through human convention, are sufficient to make us think of things to which they bear no resemblance, *why could not nature also have established some sign which would make us have a sensation of light, even if that sign had in it nothing that resembled this sensation?* And is it not thus that Nature has established laughter and tears to make us read joy and sorrow in the faces of men? (TL AT XI 4/G 4 emphasis added)

What it is most striking about this passage is the appearance of the intriguing notion of a sign established by nature. This natural sign, so we are told, would have the capacity of explaining the occurrence of sensory ideas despite the fundamental dissimilarity between them and their physical causes.

Before going any further, something needs to be said about the general context of the passage. Once again, it is clear that Descartes is concerned here with accounting for the fundamental dissimilarity between our ideas of external objects and what it is in objects that causes them. The very first line of the *Treatise on Light* expresses precisely this issue: ‘the first thing that I want to draw to your attention is that it is possible for there to be a difference between the sensation we have of it (light), that is, the idea that we form of it (...) and what it is in the objects that produces the sensation in us’ (AT XI 3/G 3 clarification added). In a

nutshell, this is the (PD). I have referred to this issue before as the explanatory gap between mechanistic explanations and mental representations.³⁰

This helps us put passage (A) in context. Descartes is arguing against a standard Aristotelian-Scholastic theory of sensory perception in which the senses are reliable sources for getting us acquainted with truths about the natural world. In particular, he has been objecting to a doctrine of assimilation between external objects and the senses, according to which the senses receive a ‘likeness’ (‘similitude’) from the object by way of a ‘sensible form’ of the object without ‘matter’. Overall, Descartes aims at showing that similarity between objects and ideas is not necessary for sensory perception, and that a relatively simple exploration of the conditions of the natural world should suffice for ruling out a teleological model such as the Aristotelian-Scholastic one (that is, a model in which we have the senses that we do *because* they are fitted for an accurate perception of the true features of objects).

Descartes also phrases the phenomenon of dissimilarity by appealing to the notion of the ‘true nature’ or ‘true image’ of bodies (TL AT XI 5/G 5, also Pr I 73, II 5, AT VIIIA 37, 42-3/CSM I 220, 225). When Descartes’ employs this expression, he refers to the structure of objects at a micro-corpuseular level, with which we are not acquainted in our ordinary sensory experience of the world.³¹ The micro-structure of objects, however, causes (at least partially) our (entirely dissimilar) ideas of those objects.³² In order to prepare the reader for

³⁰ Recall, as explained in Chapter One, that for Descartes the (PD) is not reducible to the problem of heterogeneity (*i.e.* the problem of interaction between the finite substances —mind and body). He regards substance interaction as a primitive fact beyond which there is, so to speak, ‘no asking why’. Consequently, the puzzle for Descartes is not to determine how the two substances interact *qua* different substances, but to account for the apparent arbitrariness existing between the nature of the cause (arrangement and motions of micro-particles conforming the external object, together with the isomorph formed in the brain) and the idea that is brought about in the mind as a result.

³¹ This is a vital point for understanding Descartes’ derogatory claims about sensory as a source of information about the natural world. Sensory perception only ‘occasionally and accidentally show us what external bodies are like’ (Pr II 3, AT VIIIA 41-2/CSM 224) because it does not get us acquainted with the micro-corpuseular level. This suggests that Descartes’ doctrine of the obscurity and confusion of sensory perception is more fundamental than claims about the senses deceiving us now and then about the macroscopic features of objects. This topic will be examined in Chapter Four.

³² Dissimilarity between ‘true nature’ of bodies and our ideas of those bodies is presented here by means of examples of what we standardly call secondary qualities. In this chapter, however, I do not

his main thesis that the ideas of the objects that we perceive are different from the objects themselves, Descartes provides several examples of dissimilarity that he considers less controversial concerning the ‘true nature’ of bodies. For instance, in the case of words (that is, a case of conventional signs), he points to the fact that if we actually perceived the true nature of those words, the idea of them formed as a result would concern, amongst other things, air vibrating against our ears. Instead, what happens is rather different: ‘Thus if the sense of hearing transmitted to our thought is *the true image of its object*, then instead of making us think of the sound, it would have to make us think about the motion of the parts of the air that are vibrating against our ears’ (TL AT XI 5/G 5 emphasis added).

In light of these considerations about context, we can read passage (A) as an alternative way of understanding sensory perception —a way that incorporates in a rather organic way the phenomenon of dissimilarity and attempts at explaining it. In other words, the passage presents a way of making sense of the (PD). Following the quotation, this alternative model of sensory perception includes that the mind receives a sign, this sign signifies (that is, stands for) the external object, and, by means of this semantic relation, an idea of the external object is formed in the mind. Finally, in this picture the mind seems to have the role of the interpreter. Crucially, a few lines ahead Descartes makes use of semantic terminology while suggesting that the mind might, indeed, not be passive in sensory perception by means of exercising its own causal efficacy:

...it is *our mind that represents to us* the idea of light each time the action that *signifies* it touches our eye (*ibid.* 4-5/G 4 emphases added)

A stronger expression of this notion appears in the *Comments*, including semantic terms as well:

... strictly speaking, sight in itself presents nothing but pictures, and hearing nothing but utterances and sounds. So everything over and above these

focus on the distinction between types of qualities in Descartes. In Chapter 4 I will assess this issue and I will argue for the claim that the phenomenon of dissimilarity between the ‘true nature’ of bodies and our ideas of those bodies affects equally ideas of primary and secondary qualities.

utterances and pictures which we think of as being signified by them is represented to us by means of ideas which come to us from no other source than our own faculty of thinking (CB AT VIII B 360-1/CSM I 305)

It is, at any rate, perhaps too soon to establish such a conclusion about the mind's causal efficacy in sensory perception. A few more aspects of the passage above still need to be pointed out. For example, it cannot be denied that the passage contains an analogy between conventional and natural signs. The analogy serves the concrete purpose of dismantling the similarity policy that underpins a standard Aristotelian-Scholastic doctrine (Wilson 1991:296). It is meant to ease the transition between two models of sensory perception, and it can be read as intended for a sceptical reader that will need some convincing. The question, however, is whether the analogy introduces something else that might count as a genuine aspect of the Cartesian theory of sensory perception. I argue for the claim that, apart from effectively ruling out a similarity assumption, the analogy has the capacity of offering a substitute for it. Passage (A), so I contend, is better understood as making initial use of an analogy for the further purpose of constructing an argument that functions by means of an *a fortiori* component. It can be reconstructed as follows:

(P1) While being entirely dissimilar from its significatum, a sign has the ability of directing thought towards that which is being signified.

(P2) Words (for instance) signify only through human convention, and that is nevertheless sufficient to direct our thought towards their referent.

(P3) (Descartes' assumption) A human convention is an imperfect version of a convention established by Nature (meaning that anything that humans can do, natural institution can do more perfectly)

(C) Therefore, *a fortiori*, nothing prevents Nature from having established a semantic relation between quantitative notions (constituting the object and its isomorph in the brain) and qualitative notions (constituting the idea of the object formed in the mind).

I now concentrate on two considerations about this argument:

- (I) The first one is what I have named ‘Descartes’ assumption’ in (P3), which is what makes the argument work (*i.e.* anything that humans can do, natural institution can do more perfectly). I believe that Descartes’ assumption amounts to an *a fortiori* postulation that makes of the analogy between conventional and natural signs something more than an analogy. If the introduction of the example of words was intended *just* as an analogy, and the introduction of natural signs *just* as metaphorical talk, the accent of the argument would not need to be on the reliability and the robustness of the correlation between the sign and the significatum (‘if words, which signify something only through human convention, are sufficient to make us think of things to which they bear no resemblance...’). If the passage was not meant to establish any further point about the workings of sensory perception, it could simply include an analogy the upshot of which would be that language functions like nature, or vice versa. What Descartes is telling us in passage (A), however, is that nature functions *better* than language. The analogy with conventional signs seems to serve the purpose of introducing the important point that nature works by means of a more sophisticated semantic scheme. Presumably, something that makes nature’s workings superior in this respect is the necessary character (that is, not subjected to human convention) of the correlation between sign and significatum.
- (II) The second consideration involves the phenomenon of dissimilarity. Before going any further, recall that dissimilarity is the shared feature that all of Descartes’ semantic schemes revolve around (as seen in §2). Natural signs are no different, given that they appear in the text as an explanatory device for sensory perception. Passage (A) advances the claim that, if human convention (being so counterfactually fragile in a nominalist picture, it could be added) is able to exert influence on our mind in such a consistent and effective manner (by *always* prompting the creation of the appropriate idea of the significatum in the mind), natural ordination is all the more capable of bridging the gap between physical and mental states (between the ‘true nature’ of objects, the brain states, and the ideas of those objects in our mind). Dissimilarity plays an important part in this scheme, of course. The *a fortiori* component of ‘Descartes’ assumption’ (P3 in the argument) also encompasses this

aspect: if something human-made (language) can operate despite of the presence of complete dissimilarity, something instituted by nature (sensory perception) can all the more bridge a dissimilarity gap *mutatis mutandis*. The result, after ‘all relevant changes have been made’, reveals that, in the case, of natural signs, the correlation between sign and significatum is in a way necessary.

3.1.1. The necessity of an arbitrary correlation

A question appears now: what does it mean that the connection between sign and significatum is ‘necessary’ in this context? To begin with, one could object at this point that natural ordination is in no way superior to human convention because both are recognised by Descartes as arbitrary. Certainly, Descartes asserts on several occasions that the particular correlations between physical states and mental states that we are familiar with *could have been otherwise*. A treatment of this topic appears notably in Meditation Six in the context of recounting the union of mind and body:

God could have made the nature of man such that this particular motion in the brain indicated something else to the mind; it might, for example have made the mind aware of the actual motion occurring in the brain, or in the foot (...) or it might have indicated something else entirely (AT VII 88/CSM II 60-1)³³

The reason for concluding this, according to Descartes, is that there is no apparent intelligible connection in the correlations between physical and mental states (*ibid.* 76/53). From this, it cannot be denied that natural signs seem to be on a par with the rest of signs (conventional and external) when it comes to the arbitrary character of particular correlations. In other words, in this respect, correlations involving natural signs do not exhibit any special robustness. Yet this is not the whole story. The key for understanding Descartes’ position here is to qualify the reason he has for invoking arbitrariness. He invokes

³³ This idea is restated a few times throughout Meditation Six: ‘why should that curious sensation of pain give rise to a particular distress in the mind; or why should a certain kind of delight follow on a tickling sensation?’ (AT VII 76/CSM II 52-53, see also *ibid.* 83/57).

it precisely *due to* the lack of an apparent intelligible connection. What Descartes is telling us here is that, upon the inspection of a sign (any kind of sign), one could never infer, *a priori*, the type of response that it will elicit in the mind. This will only be possible by gaining knowledge of a code (that is, knowledge of the particular correspondences and its expected outcomes). This is, certainly, a property that is common to external, conventional, and natural signs.³⁴

For example, if one could observe the isomorph that is ultimately formed in the brain as a result of the action of an external object on the senses, one could not derive, *only* from an inspection of it, which idea will be brought about in the mind. Similarly, by *just* scrutinising the physiological changes that lead to the passion of joy (following Cartesian terms), one could only acknowledge a certain discharge of animal spirits, an increased blood flow in the heart, and an external manifestation of those changes, for instance, in the form of blushing and laughter. It would not be possible to infer from that, however, the type of qualitative response that arises in the mind as ‘joy’. Finally, an example with conventional signs is similarly straightforward. An English speaker would not be able to gather anything from the Catalan word ‘*roure*’ by simply contemplating the letters that compose it—even if doing so conscientiously. With knowledge of the relevant code and its expected outcomes, she would come to know that it has the same referent as the English word ‘oak’ and the appropriate idea would be produced by the mind.

All signs are arbitrary in this qualified sense. At the same time, nevertheless, natural signs seem to be endowed with a special counterfactual force. It is true that ‘God could have made

³⁴ In the case of conventional signs, this idea was accompanied by the nominalist stance that Descartes expressed, for instance, with a reference to Adamic innocence (as specified a few pages above). For the case of sensory perception, for instance, he writes: ‘There is simply no reason to suppose that there is something in fire whatever it might turn out to be, which produces in us the feelings of heat or pain’ (MM, AT VII 57/CSM 83). I am aware that Descartes is in this passage mainly taking issue with (what he identifies as) the Aristotelian-Scholastic thesis that sensation requires the existence of *real qualities* in the objects resembling our ideas of them. This confrontation of theories about sensory perception is explored in Chapter Four. In any case, regardless of the main aim of the passage, it can be seen as also illustrating the fact that without knowledge of the relevant correlations and outcomes, nothing about our idea/sensation of fire could be asserted by only examining the ‘true nature’ of fire (following Descartes’ expression).

the nature of man' so that, for instance, the touch of fire produces pleasure instead of pain (MM, AT VII 88/CSM II 60). But there is a sense in which brain states (as natural signs) are correlated with mental states in a more robust, stable way insofar as they are a product of natural institution instead of human will and, crucially, natural institution is identified in Descartes with an optimal divine order aimed at the preservation of the human being. In this sense, natural signs are to be considered arbitrary but not contingent because the order of nature, as stemming from God's initial ordination via a principle of parsimony,³⁵ grounds them as correlations that, in this precise sense, *could not have been otherwise*.³⁶ Across Descartes' taxonomy of signs, only natural signs present, despite their arbitrariness as qualified above, an advantage of such magnitude. The treatment of the topic in Meditation Six sketched above includes a conclusion to this effect:

Any given movement occurring in the part of the brain that immediately affects the mind produces just one corresponding sensation; and hence the best system that could be devised is that it should produce the sensation which, of all possible sensations, is most specially and most frequently conducive to the preservation of the healthy man. And experience shows that the sensations which nature has given us are all of this kind; so there is absolutely nothing to be found in them that does not bear witness to the power and goodness of God (*ibid.* 87-8/60).

Before finishing the section, it is worth recapitulating two implications of Descartes' treatment of natural signs. First, the manner in which he conceives of natural institution as working 'better' than human convention in the analogy of the *Treatise on Light* refers to his particular way of *making* necessary the arbitrary correlations between physical and mental states. I contend that this idea is encapsulated by what I have called 'Descartes' assumption' in the reconstruction of his argument, and that it is what suggests more forcefully that Descartes is not employing metaphorical terms. Second, however problematic Descartes'

³⁵ It is rather clear that Descartes counts on the principle of parsimony, for different purposes, throughout his entire corpus. In the *Treatise on Light*, for example, he declares that 'Nature always acts by the simplest and easiest means' (AT XI 201/G 168).

³⁶ Descartes' allusion to the functional argument for survival seems to support this conclusion.

argument for the preservation of the human being might be on its own,³⁷ it provides the tools, as we have seen, for understanding better what underpins ‘Descartes’ assumption’ in the analogy between types of signs.

Finally, it will prove valuable to bear in mind that, amongst Descartes’ descriptions of the interaction between brain and mind in sensory perception, the appearance of natural signs is the only one, to my knowledge, that is equipped with a claim about ‘how strong’ is the connection between brain states and mental states. Dissimilarity (or the apparent lack of intelligibility) does not compromise these correlations. One could imagine the otherwise successful correlations established by means of conventional signs failing in some way (let us imagine a case involving illiteracy, or a case of miscommunication). But, if *even* with these shortcomings language functions remarkably well, that tells us something about how successful a system of natural signification must be. This textual fact, I believe, is one of the instances that unveils Descartes’ effort in exhausting naturalistic explanations in accounting for the interaction of the brain and the mind. I will assess the scope of Cartesian naturalistic explanations in §4 of this chapter. Before that, I finish §3 by offering additional textual support for a semantic model.

3.2. NATURAL SIGNIFICATION IN DESCARTES’ TEXTS

Certainly, a defence of a semantic model for sensory perception in Descartes requires more textual support. The question is now whether there is a way of consistently identifying the semantic scheme from the *Treatise on Light*, examined in the previous section, across

³⁷ Briefly, the argument for the preservation of the human being (the preservation of the union of mind and body), could be charged, for instance, with circularity. To the question of why certain correlations between physical and mental states are the case, Descartes responds with the claim that such correlations are the better suited for survival. But that in a way restates the question itself again—why are such correlations the better suited for survival? On another note, the argument can also be charged with appealing to a teleological explanation (certain correlations between physical and mental states are the case because of a natural goal of survival of the human being). On the face of it, this clashes with a notable aim of Descartes’ natural philosophy *i.e.* to eliminate teleology from explanation of natural processes. This is not, in any case, a fatal criticism. For a reconciling interpretation, see Simmons (2001).

Descartes' descriptions of sensory perception. By means of an analysis of the rest of relevant passages I single out a constant approach to sensory perception in which (a) there is a sign and a significatum, (b) those roles are always attributed to the same components of the process, and (c) there is no metaphorical talk involved.

The second relevant passage to consider is found in Meditation Six, where Descartes outlines again the interaction of brain and mind using semantic terms. There, he writes that in sensory perception, 'signals' are 'presented to the mind' and, as a result, a sensation is elicited. Note, at the same time, that there is no hint of metaphorical talk in the passage:

Passage (B)

Every time this part of the brain is in a given state, it presents the same signals to the mind, even though the other parts of the body may be in a different condition at the time (...) For example, when the nerves in the foot are set in motion in a violent and unusual manner, this motion, by way of the spinal cord, reaches the inner parts of the brain, and there gives the mind its signal for having a certain sensation, namely the sensation of a pain as occurring in the foot (AT VII 86/CSM II 59-60, emphases added)

Again, the picture of the process of sensory perception that Descartes presents in this passage is one in which brain states act as signs of certain physical interactions between objects and the perceiver's body (the significatum). Brain states, consequently, are signs *of something for* the mind. As a result, the mind produces the outcome of the semantic relation, that is, it produces a sensory idea. Note that, even if very concisely, Descartes leaves room in this extract for the mind's own causal efficacy —the brain state, he writes, 'gives the mind its signal for having a certain sensation'.

Passage (B) and its context express with particular clarity that the role of the (natural) sign is to be attributed to brain states, and not to any other component of the process. We read that it is only the brain —and specifically its inner parts— where signals are presented to the mind. Just a few lines before, Descartes had also written that 'the mind is not affected by all parts of the body, but only by the brain, or perhaps just by one small part of the brain, namely the part which is said to contain the "common sense"' (*ibid.* 86/59). Now,

according to Descartes' earlier physiological studies, we also know that what is located in the interior cavities of the brain is the pineal gland³⁸ and that the isomorph of the external object is formed there (as a result of the process set off by external objects and carried out by the action of the nerves and the precursory electrical impulses that are the animal spirits). The equivalence of these descriptions provides a good case for considering, beyond doubt, that the role of the sign in this semantic scheme belongs to the isomorph (which is, at any rate, a certain brain state).

Finally, the last passage to inspect is found in the Fourth Discourse of the *Optics*, where Descartes mentions signs in the context of rejecting a standard Aristotelian-Scholastic doctrine that casts sensory perception in terms of a necessary, given similarity between external objects and ideas. After criticising the explanatory impotency of such theory,³⁹ he introduces an alternative conception of the transmission of information: first from the objects to the brain, and then from the brain to the mind. He follows a similar strategy as in the *Treatise on Light* by extrapolating the operation of conventional signs to the function of the isomorph formed in the brain. Once more, the function that they have in common is that of bridging a gap of dissimilarity between a cause and effect:

Passage (C)

We should, however, recall that our mind can be stimulated by many things other than images - by signs and words, for example, which in no way resemble the things they signify [...] Now we must think of the images⁴⁰ formed in our

³⁸ Descartes inherited the Aristotelian notion of 'common sense' (*sensus communis*) from the Scholastics, and he defined it as an actual place in the brain which receives the different information from the five external senses and unifies it in a single structural representation of an object.

³⁹ 'For since their conception of the images is confined to the requirement that they should resemble the objects they represent, the philosophers cannot possibly show us how the images can be formed by the objects, or how they can be received by the external sense organs and transmitted by the nerves to the brain' (Op AT VI 112/CSM I 156)

⁴⁰ By 'images', Descartes refers here to what I have been referring more technically as 'isomorph' and, more generally, as 'brain state'. There is, in Discourse Four of the *Optics*, an important transition to an alternative way of conceiving of the state of the brain in sensory perception. It is understandable, in this context, that Descartes' terminology still has an Aristotelian-Scholastic tone. As I see it, he is especially cautious in this transition in order to convince a sceptical reader. He maintains the term

brain in just the same way, and note that the problem is to know simply how they can enable the soul to have sensory perceptions of all the various qualities of the objects to which they correspond - not to know how they can resemble these objects (Op AT VI 112-113/CSM I 165-166 emphasis added)

Interestingly, Descartes' choice of words in this passage includes 'stimulation' (or the similar 'excitation', since the original French text reads 'exciter') for capturing the action by means of which semantic relations work. We are also asked to think of sensory perception 'in just the same way' ('en même façon'). Presumably, then, we can reconstruct a picture of the theory of sensory perception in which the isomorph formed in the brain is dissimilar in a non-problematic way from the external object that primarily caused it, but dissimilar nonetheless.⁴¹ This isomorph excites, or stimulates, the mind to form a sensory idea. Consequently, the scheme that passage (C) displays is equivalent to that of passages (A) and (B). A brief argument can be reconstructed for showing, in particular, the resemblance of (C) with the argument of the *Treatise on Light*, given that they both have their starting point in an analogy with conventional signs:

- (P1) Conventional signs do not resemble the things that they signify, and they are able to excite the mind.
- (P2) We must think of the isomorph formed in the brain during sensory perception 'in the same way'.
-
- (C) Therefore, the isomorph does not resemble the thing that it *signifies*, and it is able to stimulate the mind.

'images' while asking, at the same time, that one should think of their nature 'in an entirely different manner' (*ibid.* 112/165).

⁴¹ Recall, as exposed in Chapter One, that there are two instances of dissimilarity in the process of sensory perception. The first one occurs between the external object and the isomorph ultimately formed in the brain as a result. The second one is what I have been referring to as the Problem of Dissimilarity (PD). I have labelled the former as 'non-problematic' because it is explained in a naturalistic way by Descartes' mechanistic physiology in terms of motion correspondences that mirror the geometrically derived properties of objects and that are transmitted through the nerves and to the brain by the action of the animal spirits. It is, therefore, an instance of dissimilarity (two-dimensional brain states do not resemble the physical objects that we experience), but it is traceable as a naturalistic explanation. An approach to this notion of dissimilarity is developed in Chapter Four, where the focus is an assessment of primary and secondary qualities.

In summary, these two additional passages restate a scheme in which the roles of the sign, the significatum, and the interpreter of their correlation are attributed to the same components of the process. Now, even though a textual analysis can assist in the task of presenting a semantic model as a plausible interpretation, the fact that Descartes writes about natural signs and signification with a genuine metaphysical purpose might still appear odd from the point of view of the philosophical context of the seventeenth century. I finish §3 with a brief look at the historical precedent of Descartes' semantic model.

3.2.1. Brief overview of precedents

Indeed, Descartes' reference to natural signs has been characterised in the literature as a 'startling' addition (Slezak 2000:543), as presenting a scheme that is the reverse of what one might expect from Descartes' system of philosophy (Yolton 1984:23), and as not having a clear place in the early modern philosophical context (Yolton 1996). In a slightly more positive tone, it has also been looked on as an 'intriguing but implausible' model (Simmons 2003:561). While a causal-semantic model for sensory perception is not (at least explicitly) an overwhelmingly preferred model throughout the early modern period, to consider it as anomalous and as unnecessarily bizarre is also a mistake. As a matter of fact, a study of the nature and type of signs (*i.e.* the discipline of semiotics) flourished during the Middle Ages, and it became a common topic in the *disputationes* of the late Scholastics.⁴² Specifically, the Conimbricenses produced an in-depth treatment of signs that Descartes most likely read during his studies at La Flèche. The Conimbricenses (in English, the 'Coimbra Commentators', or 'Coimbrans') were a group of Jesuits at the University of Coimbra (between 1592-1606) that produced a set of commentaries on Aristotle's works that were to

⁴² Also referred as 'Second Scholasticism', Late Scholasticism corresponds to the period of revitalisation of scholastic thought in the sixteenth century and the first decades of the seventeenth century. Amongst other scholastic schools of thought at the time, the Society of Jesus (founded in Spain in 1540 by St. Ignatius of Loyola) became an important intellectual force. The list of notable Jesuit thinkers includes Francisco Suárez, Pedro da Fonseca (who received the epithet of the 'Portuguese Aristotle'), and the influential group at the University of Coimbra (Portugal) that received the name of Conimbricenses. I focus on them in the upcoming paragraphs.

be used as normative philosophy textbooks. Their commentaries became remarkably popular—they were reprinted several times during the seventeenth century and they were distributed even in Protestant countries (Solère 2015:150). These commentaries were part of the curriculum at La Flèche at the time of Descartes (who studied there from 1606 to 1615). He reminisces about that twice in his correspondence with Mersenne.⁴³ Descartes does not acknowledge a concrete influence of the Conimbricenses on his thought (yet that was not his habit regarding any intellectual debts, Scholastic or otherwise),⁴⁴ but it is nevertheless worth noting that they examined the nature and types of signs in their extensive commentary of Aristotle's *De Interpretatione* (the second part of Aristotle's Logic—or *Organon*). Most importantly, they drew at least two distinctions between types of signs that are reflected in Descartes' own treatment—be that deliberate or coincidental. The first one (1) is a distinction between 'natural signs' and 'signs by institution' that is similar to the one that Descartes establishes between natural and conventional signs. They state, first of all, that 'a sign is anything which represents something other than itself to a knowing power' (Q.2, Art.1/Doyle 2011:57). That being said, natural signs are those that have the capability to represent things by its own nature, whereas signs by institution need someone to impose that capability on them. While the former 'signify the same thing for all', the latter are in

⁴³ 'I am due to receive the objections of the Jesuits, and I think I should hold myself in readiness for them. Meanwhile I should like to reread some of their philosophy, which I have not looked at for twenty years. I want to see if I like it better now than I did before. For this purpose, I beg you to send me the names of the authors who have written textbooks of philosophy, and to tell me which are the most commonly used, and whether they have any new ones since twenty years ago. I remember only some of the Conimbricenses, Toletus and Rubius' (To Mersenne, 30th September 1640, AT III 185/CSMK III 154). See also To Mersenne, 3rd December 1640, AT III 251 (not included in the CSMK edition). In preparing the rejoinder to the philosophy of the 'School' that eventually became his *Principles*, Descartes tells Mersenne that he would like to write in response to the doctrine of the 'Society' (of Jesus) in general, rather than to criticise a specific author. For these purposes, so he writes, the commentaries of the Conimbricenses that he got to know at La Flèche are 'too long' ('Les Conimbres, ils sont trop longs; mais je souhaiterais bien de bon cœur, qu'ils eussent écrit aussi brièvement que l'autre, et j'aimerais bien mieux avoir affaire à la grande Société, qu'à un particulier').

⁴⁴ For example, the distinction between formal and objective reality was present in the works of F. Suárez and P. Da Fonseca. Similarly, Descartes did not acknowledge the influence of Beeckman on his micro-corpusecular mechanism, and his mathematical natural philosophy in general (in fact, the relationship between the two was rather quarrelsome for years). Recently, Cristia Mercer (2016) has made a compelling case for the unrecognised debt of Descartes to Teresa of Ávila. She elaborates on a comparison between the structure of St. Teresa's *Interior Castle* and Descartes' *Meditations*.

that respect less reliable because they are subjected to human will.⁴⁵ This idea is reflected in Descartes' account of natural and conventional signs, especially in his account of what makes natural signification a reliable and robust correlation and, thus, a good contender for explaining sensory perception.

In fact, the use of signs in the context of cognition had been explored before Descartes,⁴⁶ and this is apparent from the Conimbricenses' distinction between 'instrumental' and 'formal' signs. The precedent in the classification of signs between formal and instrumental has also been noticed by Behan (2000). This is the second distinction to consider. (2) Bearing in mind the general definition of sign mentioned above, an instrumental sign is a sign which we are aware of as an external object. One gets acquainted with that sign as such and, by mediation of it, also gets to know its significatum. Words are signs of this type. In contrast, formal signs are themselves not known as objects of experience, but they produce knowledge by 'in-forming' a cognitive power.⁴⁷ They are, in sum, mediators in acts of cognition. It is possible to see in this distinction a precedent of Descartes' formulation of brain states as natural signs. We have seen, throughout this section, that a key difference between natural and other type of signs consists in the robustness of connection that unites correlations between sign and significatum. At the same time, it is also possible to identify another important contrast whereby conventional signs are known themselves as objects in order to trigger the formation of an idea, while natural signs enable the formation of sensory

⁴⁵ The Conimbricenses put it as follows: 'Certain signs are natural, others are by institution (...) whatever represents something besides itself has the power to make that representation either from its own nature or by benefit of something else (...). If it has the power from its nature, it is a natural sign; if it has the power by benefit of someone imposing it, then it is by institution (...) Moreover, natural signs are those which signify the same thing for all (...) But signs by institution are those which signify by human will' (Q.2, Art.1/Doyle 2011:57).

⁴⁶ Behan (2000) traces back this idea to Augustine of Hippo, and he quotes a passage of *De Doctrina Cristiana*: 'a sign is a thing which, in addition to the species that it impresses on the senses, makes something other than itself come into the mind' (II.1/cited in Behan 2000:528). Closer to Descartes, Eustache of St. Paul had also worked on the topic of signs in his *Summa Philosophiae Quadripartita* (1609).

⁴⁷ 'Everything by whose mediation we know something else must be itself first either known or not known to us. If it must be known, it is an instrumental sign; if not then it is formal. It is called formal because it causes knowledge by informing it' (Q.2, Art. 1/Doyle 2011:59).

ideas without being themselves objects of our awareness. Just like the formal signs of the late Scholastics, they seem to have the function of making cognition itself possible.⁴⁸

The attribution to Descartes of a Scholastic notion (even if partial, or just in some respects) is certainly debatable, mainly because we know of his overall intellectual aim of replacing the philosophy of the School. If anything, it seems that he should be read as drifting away from those notions. At the same time, it is not controversial to say, within the Cartesian scholarship, that this should not be taken at face value. Despite his undeniable new contributions, Descartes also maintained Scholastic metaphysical terminology (notably, from Suárez and da Fonseca), as well as actual bits of philosophy (for instance, the distinction between formal and objective reality, or his version of the ontological proof of the existence of God). To this conclusion, it is also worth noting that an account of semiotics including a distinction between natural and conventional signs lived on after Descartes in the Port-Royal Logic⁴⁹, which was overtly Cartesian.⁵⁰

⁴⁸ Because of the interesting implications of the relation between formal and natural signs, I will look at it in finer detail in the last section (§4), where I consider the issue of the interpretative activity of the mind.

⁴⁹ Commonly referred to as ‘Port-Royal Logic’, this is Antoine Arnauld’s and Pierre Nicole’s *Logic or the Art of Thinking* (1662). This textbook on logic (which also included topics on metaphysics, epistemology, grammar, and philosophy of language) became the most influential of its kind from Aristotle until the end of the nineteenth century (Buroker 2006:xxiii). Arnauld and Nicole were associated with the Port-Royal Abbey, which had become the base of the Jansenist movement. In short, Jansenism was a French Catholic movement stemming from Augustine’s doctrine of the relation of free will to the need of divine grace. Jansenism centred around a low conception of the nature of the human being (who cannot act morally out of their own free will) which also included scepticism regarding the use of reason. While defending Jansenism against charges of heresy, Arnauld and Nicole, however, distanced themselves from such pessimistic conception and embraced emphatically Cartesian rationalism. The Port-Royal Logic is, in fact, a treatise on Cartesian philosophy. Descartes’ theory of ideas, his dualism, and even his position on language are present in it.

⁵⁰ ‘The third classification of signs is between natural signs, which do not depend on human fancy (...) and others that are only instituted or conventional’ (I.4/Buroker 1996:36-37).

3.3. NATURAL SIGNS: COROLLARY

In light of the textual analysis of this section, I extract the following implications for the status of natural signs in Descartes and, consequently, for the viability of a causal-semantic model for sensory perception.

First, the main objective of this textual analysis has been to challenge a widespread interpretation according to which natural signs are simply a figure of speech in the Cartesian texts and, consequently, should not be seen as indicative of any specific causal model for sensory perception. I have argued for the claim that, even when an initial analogy is made between conventional and natural signs (namely, in the *Treatise on Light*), Descartes can be read as primarily putting forward an argument to the effect that it is language that mirrors the superior workings of nature, and not vice-versa. By means of what I have called ‘Descartes’ assumption’ (*i.e.* anything that human beings can do, natural institution can do more perfectly), he starts presenting a model for sensory perception in which correlations between physical and mental states exhibit a necessity that no other type of sign incorporates. The genuine (non-metaphorical) character of natural signs as a notion of metaphysical weight is also supported by other textual occurrences. Passage (B), which is found in Meditation Six, displays a particularly authoritative tone: it does not include any analogy nor metaphor, and it mirrors accurately Descartes’ physiology.

Second, the characteristics of natural signs that have been singled out throughout the analysis square well with Descartes’ taxonomy of signs as presented in §2 above. There, I showed that Descartes’ introduction of a general notion of sign in explanation can hardly be considered as an anomaly. As a matter of fact, he held a remarkably stable position concerning semantic relations for the case of conventional and external signs. Given this, any charitable approach, as I see it, should consider the possibility that the third type of sign that enters the picture (*i.e.* natural signs) is also part of Descartes’ considered doctrine. In other words, as I have mentioned before, a semantic narrative is not foreign to Descartes’ thought.

This claim receives additional support from the fact that the three characteristics that I singled out at the end of §2 above as the shared features of conventional and external signs also appear in the case of natural signs as well. They are the following: (i) they constitute a picture of semantic relations with the same components: a sign, a significatum, an interpreter of the relation between the two, and an outcome in the form of an idea of the significatum. (ii) The semantic relation between sign and significatum can be realised, at least in principle, without any conscious activity. (iii) The semantic relation appears in Descartes' explanations when the phenomenon of dissimilarity between physical and mental states is at stake. On the basis of these common characteristics, I suggest that there is a consistent taxonomy of signs in Descartes. To put it simply, it makes sense to talk about Descartes' considered view on signs. For further support, I have provided a brief overview of a philosophical precedent of a theory of natural signs (chiefly, the Conimbricenses), that show that the notion was not unusual at the time.

SECTION 4. TOWARDS A CAUSAL-SEMANTIC MODEL

After having examined the textual support for a causal-semantic model (that is, the import of Descartes' allusions to natural signs), I will now delve into two further features of my view. First (§4.1) I explore in finer detail whether it is plausible that Descartes held a triadic relation between a sign, a significatum, and their relation to a 'cognitive power' whose task is to interpret. Second (§4.2), I suggest that a causal-semantic model is particularly favourable to Descartes' naturalism about the mental. The argument for this claim relies on a methodological policy called 'Qualified Explanatory Naturalism' (Chignell 2009).

4.1. SIGNS FOR A COGNITIVE POWER

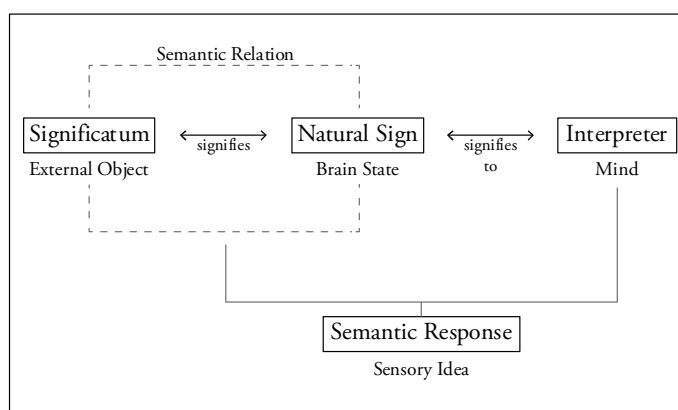
At the beginning of this chapter, I mentioned that a causal-semantic model reveals an important feature of the way in which Descartes understood the workings of sensory perception. This feature, as stated before, is the activity of the mind. A non-trivial sense in which the mind is active in sensory perception has entered the picture of the semantic model in the form of an interpreter, or decoder of signs. On one hand, we have looked at passages that suggest that the mind *does something* as a result of the triggering action of brain states. The incorporation of causal efficacy of the mind in sensory perception into a semantic model is seen, for example, in the *Treatise on Light*: ‘it is our mind that represents to us the idea of light each time the action that signifies it touches our eye’ (AT XI 4-5/G 4). On the other hand, Descartes’ taxonomy of signs offered a stable characterisation of semantic relations across the board that includes a sign, a significatum, an interpreter, and an outcome in the form of an idea of the significatum.⁵¹ Recall that this scheme is also contained within a standard definition of sign at the time. An archetypal version of it is the one by the Conimbricenses: ‘a sign is anything which represents something other than itself to a knowing power’ (Q.2, Art.1/Doyle 2011:57).

However, an interpreter of natural signs is different from an interpreter of conventional or external signs in a notable way. While as perceivers we get acquainted with words and facial expressions as objects, we do not experience natural signs as such. Rather, it seems that natural signs have the prior, more fundamental role of making cognition itself possible. Another way of expressing this difference is by noticing that natural signs do not play a role in the phenomenology of the experience, but rather enable it. They appear in explanation in order to account for sensory experience itself. Given this difference between natural and the rest of signs, the question is whether there is a Cartesian way of accounting for this peculiarity. I examine this question in the upcoming paragraphs.

⁵¹ In this sense semantic relations are called ‘triadic’.

As I see it, a promising way to spell out the function of natural signs and their peculiar interpretation within Descartes' thought is to explore a bit more the parallel between the late Scholastic notion of formal signs with natural signs that I introduced above (§2.3.1). In contrast to instrumental signs (such as words or facial expressions), formal signs are not themselves known as objects of experience. Their function is to inform a cognitive power in order for it to bring about knowledge of the significatum (Q.2, Art. 1/Doyle 2011:59). This is precisely the task of natural signs in Descartes' semantic model of sensory perception. By means of identifying them with brain states, natural signs enable the formation of sensory ideas without being themselves objects of our awareness. So far, this analysis of a common conception at the time seems to square well with Descartes' theory, and specifically with the claim that brain states trigger the mind's own causal efficacy (meaning, consequently, that the mind is not passive in sensory perception). Here I anticipate a figure of the whole process:

Figure 2. *The causal-semantic model*



It is true that, even if it is only due to his own insistence, one should be wary of attributing to Descartes a doctrine of sensory perception that is in some sense Scholastic. To this effect, it is important to remark that Descartes' main charge against a standard Aristotelian-Scholastic account of sensory perception is its similarity thesis accompanied by the doctrine of transmission of a 'sensible species' from the object to the perceiver's mind. I suggest, in this respect, that Descartes departs clearly from a purely Scholastic usage of semantic terms. For him, a semantic model is subordinated primarily to the conclusions of his natural philosophy. Descartes' stance against the Scholastic theory of perception is not compromised by the introduction of a semantic model that employs some late Scholastic

common terms for at least two reasons. First, we have seen that, noticeably, Descartes appeals to natural signs to deal with the dissimilarity between physical and mental states. This feature arising from his mechanism (the PD) is what shapes the theory to begin with. Second (2), a purely Scholastic account (such as the one from the Conimbricenses) identified formal signs with the ‘sensible species’ transmitted from the object as a *form* without *matter*.⁵² Descartes, however, was careful enough to assign the role of natural sign to brain states, accounted for mechanistically, and was emphatic beyond doubt about eliminating the obscure species ‘flitting through the air’ of previous doctrines (Op, AT VI 85/CSM I 154). In this sense, it can be argued that he made the necessary changes for the theory not to be Aristotelian-Scholastic in its most substantial aspect. At this point, it is helpful to recall the passage of the *Optics* that we have looked at before, where Descartes retains the (traditional) word ‘images’ for referring to brain states but urges the reader to think of them ‘in an entirely different manner from that of the philosophers’ (AT VI 112/CSM I 165).

There is a further aspect of formal signs that will assist in making sense of Descartes’ view. Behan (2000:530-1) has noted that in the assessments made by the Conimbricenses and by others at the time,⁵³ it was common to emphasise the two-fold character of signs. In particular, the Conimbricenses phrased this idea as the sign having two ‘dispositions’ —one to the object that it signifies, and the other to the cognitive power to which it represents something.⁵⁴ More technically, one disposition is ‘significative’ and the other is

⁵² Q.2, Art.1/Doyle 2001:55,57, and particularly Q.2, Art.3/*ibid.* 69

⁵³ He refers to John of St. Thomas (also known as John Poincot). Later on, Eustache of St. Paul (also known as Eustache Asseline) included a treatment of the topic in his *Summa Philosophiae Quadripartita* (1609). Incidentally, Descartes writes to Mersenne that he had bought a copy of the *Summa* to get reacquainted with the philosophy of the School for the writing of the *Principles*: ‘I do not think that the diversity of the opinions of the scholastics makes their philosophy difficult to refute. It is easy to overturn the foundations on which they all agree, and once that has been done, all their disagreements over detail will seem foolish. I have bought the *Philosophy* of Father Eustache of St Paul, which seems to me the best book of its kind ever made’ (To Mersenne, 11th November 1640, AT III 232/CSMK III 156).

⁵⁴ ‘*The True Opinion Affirming that a Sign Formally Includes Dispositions both to a Thing and to a Potency* (...) it seems more probable that a sign formally includes both dispositions. This is first inferred from the definition in which both are equally expressed. And this is most right; for if we

‘representative’.⁵⁵ That a formal sign has a significative disposition means that, by its very nature, it signifies something other than itself. The representative disposition refers to its relation to a cognitive power by means of representing something *for* it. The meaning of this instance of representation throughout the commentary of the *Conimbricenses* seems to be equivalent to ‘presenting’ or to ‘making something present’ to the mind.⁵⁶ It is interesting to observe that the double aspect of formal signs is able to accommodate rather well the way in which Descartes writes about natural signs. The two dispositions appear in the aforementioned passages of the *Treatise on Light* and Meditation Six:

It is our mind that *represents to us* the idea of light each time the action that *signifies it* touches our eye (TL, AT XI 4-5/G 4, emphases added)

Every time this part of the brain is in a given state, it *presents* the same signals to the mind (M, AT VII 86/CSM II 59, emphasis added)

A description of interaction between brain and mind in terms of the ‘presentation’ of brain states to the mind also appears in the *Passions* (PS I 32), and it is also how Descartes accounts for imagination in the *Meditations* (AT VII 75/CSM II 52). This textual fact has led some commentators —notably Wilson (1999)— to declare that Descartes’ favoured a ‘presentation model’ for sensory perception, within which the allusion to natural signs (and to signification in general) is regarded as an analogy with the sole objective of making a point about dissimilarity between sensory ideas and their physical causes (1999:43). I believe, on the contrary, that the semantic model is the one that encompasses within its workings the presentation activity, rather than vice-versa. It is certainly clear from the texts that Descartes holds that the brain ‘presents’ information to the mind. But he also makes

reflect, the whole nature of a sign cannot be grasped unless we conceive its power to make something an object for some potency’ (Q.1, Art.1/Doyle 2001:41).

⁵⁵ Note that this distinction between signification and representation is different from the one that Yolton (1984, 2000) elaborates on. He claims that the difference stands on the fact that signification is a non-causal link that connects dissimilar items (such as physical and mental states). Representation, he suggests, is a causal link that operates by means of resemblance (such as the connection between external objects and brain states). As I have stated above (§1), I do not find in the Cartesian texts any support for this division.

⁵⁶ ‘The meaning of the word ‘represent’ indicates that; for to represent is to make something present’ (Q.1, Art.2/Doyle 2001:47, see also Q.1, Art.1/*ibid.* 41).

reference to the brain ‘giving signals’, ‘giving occasion’, ‘giving means’, ‘affecting’, ‘stimulating’, ‘exciting’, and ‘making the soul sense’, and it is not obvious how these occurrences are incorporated into a presentation model.

In this regard, an interpretation of Descartes’ doctrine in terms of a semantic model has an advantage that I mentioned in passing at the beginning of the chapter. Namely, it does a good job of integrating disperse terminology. In a model in which brain states function as natural signs (meaning that natural signs signify external objects *and* present information to a cognitive power that functions as an interpreter of semantic relations), it is possible to retain ‘presentation’ terminology while at the same time incorporating the rest of expressions. On one hand, within the Cartesian model, it is not odd to affirm that insofar as natural signs signify an external object *to* the mind, they ‘present’ it, and thus they elicit the activity of the mind by means of ‘stimulation’, ‘excitation’, or by ‘giving means’. These expressions admit of a rather natural reading as encouraging the mind’s own activity. Interestingly, this peculiar kind of causal activity⁵⁷ also mirrors the way in which the Conimbricenses formulated the function of signs in respect to a cognitive power as one of ‘influencing’ and ‘arousing awareness’.⁵⁸ On the other hand, associationism (AT IV 604), occasionalist expressions, and mentions of ‘natural institution’ find a place in a semantic model because they can be seen as contained within the notion of a code. The naturally (and, in Descartes, divinely) instituted correlations between objects, brain states, and sensory ideas is cashed out in a semantic model as the necessary code that enables interpretation.

⁵⁷ Recall that this echoes the conclusion that I presented in Chapter One, according to which Descartes envisages the operation of a cause of a peculiar sort for the interaction of the brain and the mind in sensory perception.

⁵⁸ ‘That is, a sign is said to be that which, perceived by some sense, is the cause of a knower’s being carried by its influence to the knowledge of something else’ (Q.1, Art1/Doyle 2011:39). ‘A sign is what is put in the place of a thing and arouses awareness (‘notitiam affert’) of that thing’ (*ibid.*).

4.2. DESCARTES' QUALIFIED EXPLANATORY NATURALISM

In the final section of the chapter, I complete the characterisation of a causal-semantic model by assessing one main explanatory advantage that it has over rival models. Even though there is, in Descartes' theory, an ultimate appeal to divine will, a causal-semantic model attempts to exhaust the naturalistic explanations available for the interaction between the brain and the mind in sensory perception. Chignell (2009)⁵⁹ has formulated this through a methodological approach that he calls 'Qualified Explanatory Naturalism'. This approach is congenial to Descartes' goals as a natural philosopher and, in particular, as a rationalist. He defines sharply in the following way (2009:16):

(QEN) The policy of not resorting to supernaturalistic appeals until naturalistic explanations have been exhausted.

To express it in finer detail, (QEN) counts, in the context of a theory of sensory perception, as a methodological strategy that aims at securing a model that is as grounded as possible in the powers and dispositions of the human brain and the human mind. Following (QEN), God's action (although it will certainly appear at some point) is adjourned as much as possible. It is worth stating once again, as I contended in Chapter One, that a denial of genuine causal powers is not a plausible reading of Descartes' picture of sensory perception. This is not a guarantee of an immediately obvious improvement in the intelligibility of the theory, and it is certainly not a view without complications. But in any case, it is a textual fact that one should give full credit to Descartes' remark to Elizabeth that 'we have heretofore confused the notion of power with which the soul acts on the body with the power one body has to act on another' (AT III 667/S 66). The way to spell out this basic affirmation about the presence of genuine causes that are not efficient (*i.e.* transeunt) varies in the literature (as it varied at the time of Descartes). For example, associationism, occasionalism, and a reading in terms of natural institution are models of causation that

⁵⁹ In this section I follow closely the some of the insights by Chignell (2009) that I will highlight accordingly.

attempt to explain body-mind interaction while taking seriously Descartes' talk of brain states as 'occasions' for the mind. The appearance of natural signs in the texts has sometimes been read as a partial (and often non-literal) feature subordinated to these other models (see, for instance Rozemond 1999, Wilson 1991). Before delving into the explanatory advantage of the causal-semantic model, I characterise briefly the three other contenders.

- Associationism is the view that all that there is to say about the causation at stake between physical and mental states is that they exhibit constant conjunction. A brain state *B* is consistently followed by a mental state *M*.⁶⁰
- Occasionalism states that what bridges physical states with mental states is the ongoing causal activity of God. Every time that a brain is in state *B*, God intervenes as a causal agent in bringing about mental state *M*. This general formulation refers strictly to what has been named 'strong' or Malebranchian occasionalism, in which a certain physical state is an 'occasional cause' for the genuine causal efficacy of God.⁶¹
- Natural institutionalism includes finite, genuine, causal connections between physical and mental states and ultimately invokes prescribed psycho-physical laws stemming from an initial, single divine act of ordination. Hence causation between brain and mind, unlike in the occasionalist model, is self-sufficient to a greater extent. And unlike the case of associationism, a reading along the lines of natural

⁶⁰ This is, in order words, Humean associationism. The reading of Descartes as an associationist has been supported by Richardson (1982) and Loeb (1982). Chignell attributes it also to Wilson (1991), but I don't think this is correct. As I read her proposal, Wilson's 'presentation model' aims at providing at least a partial story about the *doings* of the brain and the mind in sensory perception.

⁶¹ It is noteworthy that for Malebranche and other Cartesians at the time (such as Géraud de Cordemoy and Claude Clerselier), the motivation for endorsing occasionalism is the doctrine that finite causes cannot be proper causes precisely because of their finitude (Garber 1993:24-5). This nuance sheds light on an understanding of occasionalism as different than an *ad hoc* solution to the mind-body problem. Garber (1993) has endorsed an occasionalist reading of Descartes on causation (including, interestingly, body-to-body causation). Nadler (1994) has differentiated 'strong occasionalism' from 'occasional causation', while attributing to Descartes only the latter. In occasional causation, the brain and the mind, and not God at that stage, are genuine causal powers. He puts it in this manner: 'a relationship of occasional causation exists when one thing or state of affairs brings about an effect by inducing (but not through efficient causation) another thing to exercise its own causal power' (Nadler 1994:39).

institution adds a further level of naturalistic explanation by saying a bit more about why certain physical states are correlated to certain mental states. It provides, in other words, *more* than a sequential concurrence of physical and mental states. This type of model also has the merit of being able to incorporate the causal activity of the mind that is strongly suggested by Descartes' terminology: according to a psycho-physical law *L* that stems from God's ordination of nature, a brain state *B* is an occasion for prompting the causal efficacy of the mind, which causes a mental state *M*.⁶²

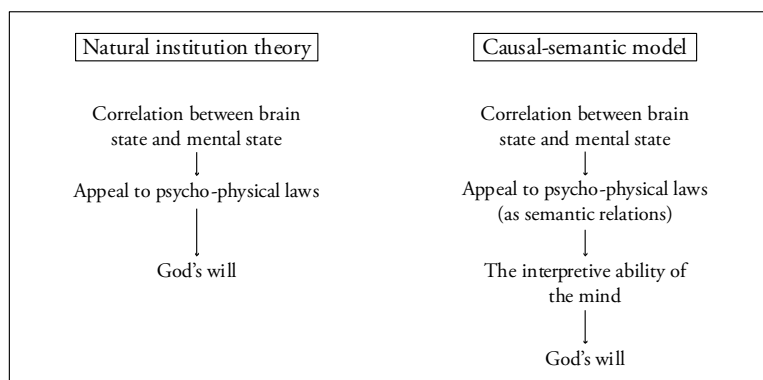
Now, a causal-semantic model also reaches 'explanatory bedrock' (Chignell 2009:5) by invoking God's ordination in the end. As a matter of fact, that God appears at some stage to explain the order of nature is a straightforward feature of Descartes' model. The point, however, is to determine when God appears, and to what extent '*He*' is implicated in the causal processes of the world. In a causal-semantic model, the specific correlations between sign, significatum, and outcome of the process (a specific sensory idea) are instituted by God in an initial, single, act of creation (accompanied in Descartes, as we have seen, by the operation of a principle of parsimony). In this regard, natural institution and the causal-semantic model are on a par. Furthermore, both models identify, in some degree, (QEN) as the methodological approach that Descartes adopts tacitly throughout his system of philosophy. On the contrary, associationism, for example, might be able to accommodate some textual occurrences in which Descartes is remarkably brief in his depictions of the theory of sensory perception, but it falls short, I believe, when it comes to explaining why he devoted so many pages and intricate terminology ('excite', 'stimulate', 'represent', 'give means') to explain the occurrence and the qualitative nature of sensory ideas. Crucially, however, in line with the aims of a rationalist natural philosopher like Descartes, a causal-semantic model does not only reveal an effort to account for the process of sensory perception in finite, genuine causal powers, but it is the model that does so to a larger extent. This interpretation runs as follows.

⁶² This reading is favoured by Shapiro (2003), Simmons (1999), Nadler (1994), and Schmaltz (1992).

The gist of this view is that a causal-semantic model postpones the appeal to God's ordination to the next level of explanation by telling us a bit more about the kind of activity that the mind performs as an interpreter of correlations between a sign and its significatum. This can be seen clearly in the comparison between the steps of explanation for a causal-semantic model and that of a natural institution theory (Fig.3 below). As a series of naturalistic causal steps that lead to sensory perception, a natural institution theory offers the following: a correlation between brain state *B* and mental state *M* is explained by an appeal to psycho-physical law *L*, which is then explained by resorting to God's will (Chignell 2009:15). As I mentioned above, the appeal to psycho-physical laws might integrate the activity of the mind, but it does not say much about why or how the mind acts on the brain, or acts within itself. Where the natural ordination view stops providing naturalistic explanations, the causal-semantic model adds a further level of explanation: the mind reads correlations between a sign and its significatum *due to* its interpretative ability. That is to say, the correlations mean something to the mind, they don't just trigger the production of concurrent content in it. Another way of putting this is by introducing the notion that the mind acts on the basis of the natural possession of a code. Thus, the scheme can be reconstructed in this manner: a correlation between brain state *B* and mental state *M* is explained by psycho-physical law *L*, in the form of a semantic relation between a sign, a significatum, and an outcome, this is then explained by the interpretative ability of the mind (the correlation *means* something for the mind), and only after this step is the appeal to God's will required.

Consequently, (QEN) is further preserved in this model by means of an additional level in which the mind identifies meaning in correlations. After that, divine ordination is summoned for explaining the seemingly arbitrary specific connections between certain arrangements and motions of particles on one hand, and the qualitative nature of sensory experience on the other. This is, as in the case of natural ordination theories, the deepest layer beyond which there is, so to speak, 'no asking why'.⁶³

⁶³ Recall the passage of Meditation Six that has been cited in §3.1.1: 'why should that curious sensation of pain give rise to a particular distress in the mind; or why should a certain kind of delight follow on a tickling sensation?' (AT VII 76/CSM II 52-53). He adds a few lines ahead: 'God could have made the nature of man such that this particular motion in the brain indicated something else

Figure 3. *Levels of Explanation* ⁶⁴

It is worth clarifying a further aspect of (QEN). I mentioned at the start of this section, that, in the context of a theory of sensory perception, the objective of this methodological policy is to ground the process in the powers and dispositions of the human brain and *also* of the human mind. This is meant to capture the sense in which Descartes' naturalism is also a naturalism about the mental. That is to say, the products of finite minds are, for Descartes, rightful components of the causal processes and thus of the ontological map of the world.⁶⁵ Before going any further, this means that the 'naturalism' in 'Qualified Explanatory Naturalism' is not equivalent to 'mechanistic explanation'. While the counterpart of 'mechanistic' is 'non-mechanistic' (*i.e.* 'non-extended', or 'immaterial') the counterpart of 'naturalistic' is 'supernaturalistic' (Chignell 2009:16).⁶⁶ In a nutshell, the explanations that (QEN) aims at exhausting are finite ones (whether material or immaterial), while postponing the (inescapable) appeal to the infinite (divine) ones. This is not to deny that, in Descartes, there is also a policy in play for adjourning non-mechanistic explanations. Charitably, an akin 'Qualified Explanatory Mechanism' could also be rightly identified in

to the mind; it might, for example have made the mind aware of the actual motion occurring in the brain, or in the foot (...) or it might have indicated something else entirely' (AT VII 88/CSM II 60-1).

⁶⁴ This table has been inspired by Chignell (2009).

⁶⁵ The fact that ideas of sensation are rightful components of the causal processes and of the true ontology of the world is developed in Chapter Four.

⁶⁶ Chignell makes the distinction between 'naturalistic' and 'mechanistic', but he does not expand on the implications for the place of sensation in Descartes' ontological map.

his natural philosophy, even if it is as a result of the goals and tools of the New Science flourishing in the seventeenth century.⁶⁷

CONCLUDING REMARKS

In this chapter I have presented a causal-semantic model for sensory perception as a theory that Descartes could have plausibly held. I have reconstructed Descartes' taxonomy of semantic relations, and I have contended that natural signs are not a figure of speech in the Cartesian narrative. Rather, they count as proper members of a taxonomy of semantic relations that also includes conventional and external signs. Aside from ample textual support, I have also provided an overview of philosophical precedents that can assist in understanding the place of a semantic model at the time of Descartes. The causal-semantic model, I believe, has proven to be a particularly successful theory for capturing a crucial contribution of Descartes to the workings of sensory perception. This contribution the activity of the mind. Overall, this examination of the causal-semantic model has demonstrated a few important explanatory advantages that were anticipated at the beginning of the Chapter. First, this model is directly supported by a number of texts and consistent with the majority of texts. Second, it is particularly integrative of disperse terminology. Third, it incorporates a notion (natural signs) that was not unusual at the time. Finally, it proves to be in line with the explanatory goals of a natural philosopher like Descartes. In this regard, it is as much of a naturalistic explanation of sensory perception as it can be.

⁶⁷ Gaukroger's view (2001) is a result, I believe, of the priority of 'Qualified Explanatory Mechanism' rather than (QEN.) To a lesser extent, so it is Hatfield's view (2015, 2017).

CHAPTER 3

MENTAL ACTIVITY AND THE INNATENESS STRATEGY

0. INTRODUCTION

In the first and second chapters, I reconstructed a causal story for Descartes' theory of sensory perception. In Chapter One, I started with a characterisation of the theoretical framework of the theory. On the basis of Descartes' mindful terminological balance, I suggested that a theory of sensory perception should contain genuine causal powers that are not of the efficient-transcendent type. In Chapter Two, I supplied the materials for this scheme in the form of a causal-semantic model. Even though Descartes did not afford a comprehensive, unambiguous doctrine of sensory perception, I sustained that his identification of natural signs with brain states marked his most refined attempt at a causal model for the process. Against readings that deem the introduction of natural signs a figure of speech with no metaphysical import, I showed that it is plausible to regard natural signs as proper members of Descartes' taxonomy of semantic relations. Furthermore, a causal-semantic model incorporated the activity of the mind, in accordance with Descartes' varying suggestions throughout his works. In short, in a causal-semantic model, the mind exerts its own causal efficacy as an interpreter of signs. The result of this activity of the mind is the production of a sensory idea, which can be understood as a semantic response that, upon decoding a correlation between the brain state (sign) and the external object (significatum), means something *for* the mind.

Certainly, a reconstruction of a plausible and textually supported causal model is necessary for any interpretative proposal of Descartes' thought that engages with the hypothesis that the mind has a substantial role in the way in which we perceive the world. At the same time, however, this is not the only issue that requires disentangling. Descartes also equipped his views on the activity of the mind with claims about innateness. Notably in the *Comments on a Certain Broadsheet* (1648), he declared somehow surprisingly that 'in no case are the ideas of things presented to us by the senses as we form them in our thinking. So much that there is *nothing in our ideas which is not innate to the mind* or the faculty of thinking' (AT VIII B 359/CSM I 304, emphasis added). In the literature, the view that, for Descartes, *all* ideas (even sensory ideas) are innate receives the name of 'universal innateness' or 'hyper-nativism' (Gorham 2002). I shall refer to it as 'hyper-nativism' for a clearer opposition with its counterpart in the Cartesian works: 'moderate nativism'. The appearance of the notion of innateness is important for the hypothesis that the mind is active in sensory perception because Descartes invokes hyper-nativism as a consequence of the Problem of Dissimilarity (PD).¹ Roughly, the reasoning appears to be that, since the representational content of sensory ideas cannot be identified with its physical causes, it cannot be brought about by them (Schmaltz 1997:34). Consequently, so the story goes, the representational content of sensory ideas must be produced innately by the mind. Once more, the causal efficacy of the mind appears in the picture of sensory perception —this time under the category of innateness.

In this chapter I will contend that hyper-nativism is Descartes' strategy for accounting for a type of mental content that is needed for the production of sensory ideas. While being the result of the mind's own efficacy as well, this type of content is different from that of his paradigmatic innate ideas (the ideas of God and mathematical notions, for example). Now, it is worth observing that the introduction of innateness as a consequence of the (PD) does not amount to a separate causal model for sensory perception that would compromise the plausibility of the causal-semantic model. As I see it, hyper-nativism is not intended as a causal model, but as a description of the type of mental content involved in the process within the

¹ As stated in Chapter One, the (PD) refers to the lack of similarity between the qualitative character of sensory experiences and the quantitative nature of the physical causes of these experiences.

theory of ideas that Descartes had established on independent grounds. To put it concisely, the workings of sensory perception involve the activity of the mind, which acts as an interpreter that contributes to the representational content of ideas. This means that there is a mental occurrence involved that needs to be categorised, just as others (such as judgments, volitions, *etc.*) were also given a place within Descartes' taxonomy of the mental. For Descartes, the category of the innate becomes the natural place for a mental occurrence that is the product of the mind's activity. This is why —as a continuation from the picture established by the causal-semantic model— this chapter receives the name of the 'innateness strategy'.

Nonetheless, an innateness strategy is not free of textual tensions. Most evidently, it clashes with the three-fold classification that Descartes presents in the *Meditations* between adventitious,² factitious, and innate ideas (AT VII 37-8/CSM II 26). This taxonomy is only moderately nativist, meaning that only *some* ideas are innate. The group of innate ideas includes our ideas of God, of eternal truths, and of fundamental logical axioms. Beyond this textual tension between hyper-nativism and moderate nativism, however, a more considerable problem arises for the Cartesian system. Hyper-nativism appears to conflict with Descartes' claim that adventitious ideas come somewhat passively from external objects. In the progression of the method of doubt in the *Meditations*, this remark prompts the argument for the existence of body via the axiomatic claim of the all-powerful, benevolent nature of God. In a nutshell, hyper-nativism compromises the three-fold taxonomy and its strategic role in the *Meditations* and, most importantly, it compromises the causal efficacy of the external world. In this chapter, I pursue a reconciling interpretation of Descartes' differing views on ideas. Specifically, I argue that it is possible for him to hold a version of hyper-nativism while preserving the causal efficacy of bodies in the production of adventitious ideas. By arguing for this claim, I side with a group of diverse reconciling responses provided, amongst others, by Jolley (1990), Schmaltz (1997), Rozemond (1999), Nelson (2008), and Boyle (2009).

² The term 'adventitious idea' appears in Descartes' theory of ideas as equivalent to what he calls 'sensory ideas' in any other contexts throughout his works. Presumably, the adjective 'adventitious' provides a terminological nuance in the context of Meditation Three, where the meditator wonders about where her diverse ideas might come from. Since at that point of the journey of the *Meditations* the existence of a sensory faculty is still uncertain, Descartes simply hypothesises that some ideas might come *from outside* ('advenire'). Accordingly, he labels them as 'adventitious'.

I structure my argumentation in three stages. In §1, I present the standard taxonomy that appears in the *Meditations*, and I explain the tension that stands between this and Descartes' hyper-nativist claims. I also reconstruct the argument for hyper-nativism that Descartes mounts in the *Comments* and I identify its implicit position in previous works. In §2, I provide a reading of Descartes' theory of ideas that renders the two opposed taxonomies compatible. Broadly, I point out that each taxonomy seeks the answer of a different causal question about ideas. As a result, two different (yet compatible) definitions of innateness arise. Finally, in §3, I sketch the implications of these definitions for Descartes' theory of sensory perception. I make a case for recognising sensory ideas as innate ideas 'adventitiously conditioned'.

SECTION 1. MODERATE NATIVISM VERSUS HYPER-NATIVISM

In this section I introduce the three-fold classification of ideas that Descartes introduces in the *Meditations* and I pinpoint the tension with the hyper-nativist taxonomy that emerges explicitly from the *Comments*.

It is commonly agreed that a main feature of Descartes' rationalism is the revival of a type of moderate nativism. In its simplest form, this is the doctrine that some of our ideas are innate, and so they are obtainable by the sole resources of the mind. These are (at least) our ideas of God, of eternal truths, and 'simple natures' (*i.e.* fundamental logical axioms).³ This view arises with special force from the *Meditations*. In Meditation Three, Descartes puts forward a rather forthright classification of ideas: ideas are either adventitious, factitious (invented by us), or innate (AT VII 37-8/CSM II 26). At first glance, and bearing in mind the taxonomy of ideas presented sharply in the *Meditations* and elsewhere, it seems that Descartes introduced innate ideas to explain *a priori* knowledge (Jolley 1990:32). For example, he also writes to Mersenne

³ The term 'common notion' ('notio communis') was, at the time of Descartes, the way to reference Euclid's axioms. Nonetheless, Descartes uses it as a synonym of logical axioms in general and even as referring to eternal truths (Cottingham 1993:37).

that some ideas ‘are adventitious, (...) others are constructed or made up (...), and others are innate, such as the idea of God, mind, body, triangle, and in general all those which represent true, immutable and eternal essences’ (16th June 1641, AT III 383/CSMK 183).

This is, however, just one part of the story. Most contemporary commentators have suggested (correctly, I believe) that innate ideas constitute an integral part of Descartes’ anti-scholastic theory of sensory perception, with wide disagreement in elucidating which role do innate ideas have, how far did Descartes go in developing the view, and whether it is compatible with the rest of his system.⁴ Again, I will argue that Descartes built innate ideas into his theory of sensory perception, and this means that he resorted to the notion of innateness in order to flesh out the type of mental content that occurs within a process determined by fundamental dissimilarity between sensory ideas and its physical causes. To this end I examine in the upcoming paragraphs the contrast between Descartes’ taxonomies of ideas.

1.1. THE TENSION WITH THE STANDARD TAXONOMY

Readers of Descartes are familiar with the taxonomy of ideas that figures in Meditation Three, according to which ideas are either innate, adventitious, or factitious. I shall refer to it as the ‘standard taxonomy’:

Standard Taxonomy

Among my ideas, some appear to be innate, some to be adventitious, and other to have been invented by me. My understanding of what a thing is, what truth is, and what thought is, seems to derive simply *from my own nature*. But my hearing a noise, as I do now, or seeing the sun, or feeling the fire, comes from things located which are located outside me, or so I have hitherto judged. Lastly, sirens, hippogriffs, and the like are my own invention (AT VII 37-8/CSM II 26 emphasis added)

⁴ Claims to this effect include, amongst others, the (very diverse) ones by Williams (1978), Jolley (1990), Wilson (1991), Cottingham (1993), Nolan (1997), Schmaltz (1997), Nelson (1998), Simmons (2003), Boyle (2009), Chignell (2009), and De Rosa (2010).

We can see in the passage that innate ideas are described, in opposition to adventitious and factitious ideas, as derived from the meditator's 'own nature', presumably in the sense that an innate idea is a product of the sole activity of the mind. However, the truth is that Descartes seldom defines concisely the notion of innate idea beyond this. In other passages, he appears to emphasise a sense in which innateness is merely a faculty or disposition to think of a particular idea. For example, he writes in his replies to Hobbes and elsewhere that 'when we say that an idea is innate in us (...) we simply mean that we have within ourselves the faculty of summoning up the idea' (Third Set of Replies, AT VII 189/CSM II 132). On the face of it, this suggests a minimal conception of innateness that is at odds with the standard taxonomy. Also, at times, lists of concrete innate ideas substitute actual definitions, and it seems to be the task of the reader to identify their unifying feature.⁵ The items in such enumerations are diverse, and sometimes they vary from text to text. In the *Rules*, he speaks of 'simple natures' that are known by the 'innate light' of the intellect, without the contribution of sensory perception. Examples of those simple natures are 'what knowledge, or doubt, or ignorance is' (AT X 419/CSM I 44). In Meditation Three he lists 'my understanding of what a thing is, what truth is and what thought is' (AT VII 38/CSM II 26). A few passages ahead, in examining the origin of the idea of God, he concludes that 'it is innate in me, just as the idea of myself is innate in me' (AT VII 51/CSM II 35). In the above letter to Mersenne from 1641 (the year of publication of the *Meditations*), he includes 'God, mind, body, triangle, and in general all those which represent true, immutable and eternal essences' (AT III 383/CSMK III 183). Finally, in the *Comments*, he challenges Regius'⁶ denial of innate ideas with the example of a fundamental logical axiom ('things which are equal to a third thing are equal to each other') while affirming that innate ideas are those that come 'solely from the power of my thinking' (AT VIII B 358-9/CSM I 303-4). For the purpose of the chapter, it is sufficient to note that what these passages emphasise about innate ideas is that they are an exclusive result of the mind's efficacy. In this regard, they can be read in agreement with the standard taxonomy in the sense that the mind is fully responsible for their

⁵ For a comprehensive treatment of the designations of innateness, see Boyle (2009).

⁶ This is Descartes' disciple Henri le Roy (Henricus Regius, 1598-1679). Descartes wrote the *Comments* in response to an (initially) anonymous pamphlet of his. I expand on this issue in §2.

production.⁷ This conclusion is in line with a straightforward reading of the standard taxonomy according to which its rationale is to establish a causal origin of ideas —where causal origin is equivalent to the source of representational content of each group.

Nevertheless, Descartes provides, in a few occasions, what seems to be a wider definition of innateness that includes sensory ideas. The moderate nativism of the *Meditations* is allegedly substituted by a hyper-nativist taxonomy that is reduced to just one category: *all* ideas, so we are told, are innate. One can find this perplexing addition most famously in the *Comments*. These are three relevant excerpts in favour of hyper-nativism:

If we bear well in mind the scope of our senses and what it is exactly that reaches our faculty of thinking by way of them, we must admit that in no case are the ideas presented to us by the senses just as we form them in our thinking. So much that there is nothing in our ideas which is not innate to the mind or the faculty of thinking (AT VIII B 358/CSM I 304)

Nothing reaches our mind from external objects through the sense organs except certain corporeal motions (...) but neither the motions themselves nor the figures arising from them are conceived by us exactly as they occur in the sense organs (...) Hence it follows that the very ideas of the motions themselves and of the figures are innate to us (*ibid.* 359/304)

The ideas of pain, colours, sounds and the like must be all the more innate if, on the occasion of certain corporeal motions, our mind is to be capable of representing them to itself, for there is no similarity between these ideas and the corporeal motions (*ibid.* 359/304)

Note, for the moment, that the three passages convey the same reasoning: given that there is a fundamental dissimilarity between sensory ideas and their physical causes, sensory ideas must be an innate product of the mind. It could be objected at this point that a one-off allusion to hyper-nativism cannot possibly count against a previous theory of ideas that, significantly, is deeply rooted and certainly required in Descartes' spiritual quest in the *Meditations*.

⁷ Here I leave aside the discussion concerning whether innate ideas are dispositions to have certain ideas that are otherwise triggered or fully-fledged mental contents.

Nevertheless, the view is not incidental. First, it had already been stated, although with less detail, in a 1641 letter to Mersenne: ‘all those (ideas) which involve no affirmation or negation are innate in us; for the sense-organs do not bring us anything which is like the idea which arises in us on the occasion of their stimulus, and so this idea must have been in us before’ (AT III 383/CSMK III 183). Second, it is noteworthy that, in the very context of the introduction of explicit hyper-nativism in the *Comments*, Descartes refers the reader back to his work in the *Optics* (‘...as I have explained at length in the *Optics*’, AT VIII B 359/CSM I 304). The recommendation is so casual that it makes the reader wonder whether hyper-nativism had already been established before, yet in a subtler manner. Together with the introduction of the (PD), the mention of his previously established natural philosophy can be taken as a first indication that Descartes is dealing here with a familiar topic. As we saw in Chapter One, the terminology chosen in the *Optics* for describing sensory perception evoked a type of cause that was different from the efficient-transcendent one operating amongst bodies within Descartes’ mechanism. This was motivated by the (PD) and it suggested that the mind had a substantial role in sensory perception. The treatment of this issue in the *Optics* is similar to that of *The World* (particularly the *Treatise on Man*), but of course Descartes cannot refer back to it because it remained unpublished until after his death.

To recapitulate Descartes’ two positions, he endorses moderate nativism in the *Meditations*, while in the *Comments* the three categories of the standard taxonomy are reduced to one. Given that the standard taxonomy has become a point of reference for understanding what makes ideas innate, adventitious, or factitious, hyper-nativism introduces tensions in Descartes’ thought. It is immediately problematic for at least two reasons: one is purely textual, and the other concerns the philosophical consistency of the Cartesian system.

(1) First, on the face of it, hyper-nativism is at odds with the sharp and seemingly authoritative standard taxonomy. Moderate nativism and hyper-nativism seem to mutually exclude each other, that is, either *some* ideas are innate, or *all* ideas are innate. It is of course possible that in between the *Meditations* (1641) and the *Comments* (1648) Descartes changed his mind about the notion of innateness. But we are not given any reasons for this change. If anything, the rest of the content of the *Comments* provides evidence for thinking that Descartes’ views are the same. At best, it seems, we are left with a glaring textual contradiction.

(2) Second, and most importantly, the opposition between moderate and hyper-nativism creates a rather formidable tension for the Cartesian system. Recall that the classification of ideas amongst adventitious, factitious, and innate serves a central function in the process of advancing towards new truths by means of Descartes' method of doubt. After having reached the knowledge that she is a 'thinking thing' (*i.e.* the discovery of the indubitable truth of the *cogito* towards the end of Meditation Two) the next step that the meditator needs to take is to analyse the sorts of ideas that can be found in the mind. Consequently, Descartes starts Meditation Three by outlining this strategy:

I will attempt to achieve little by little, a more intimate knowledge of myself. I am a thing that thinks: that is, a thing that doubts, affirms, denies, understands a few things, is ignorant of many things (...) Now I will cast around more carefully to see whether they might be other things within me which I have not yet noticed (...) First, however, considerations of order appear to dictate that I now classify my thoughts into definite kinds (AT VII 35-7/CSM II 24-5)

This passage constitutes the preamble to the standard taxonomy, which is hypothetical in Meditation Three (since the meditator has not yet attained knowledge of the existence of the external world), and it is made genuine in Meditation Six (when the existence of the external world has been proven). What it is most important is that, within the method of doubt, the step of analysing the types of ideas 'within me' is not only the preliminary step for a hypothetical standard taxonomy, but it is also the catalyst for the cosmological argument for the existence of God and, in turn, for the argument for the existence of the external world. Regarding the latter, the main point of contention is that Descartes' hyper-nativism seems incompatible with his point in Meditations Three and Six about sensory ideas being received somewhat passively from external objects—which is what appears to be the rationale behind the category of the adventitious as opposed to the factitious and the innate. This compromises the subsequent proof of the existence of bodies, which relies upon realising a strong tendency to believe that sensory ideas come from external objects *together* with the axiomatic point about God's all-powerful, benevolent nature.

This amounts to the claim that, if sensory ideas are not caused by external objects (that is, if instead of being adventitious, they are, in fact, innate), God's perfection is compromised.

Descartes was categorical about the matter, most notably in his proof of the external world in Meditation Six: ‘I do not see how God could be understood to be anything but a deceiver if the ideas (of external objects) were transmitted from a source other than corporeal things. It follows that corporeal things exist’ (AT VII 80/CSM II 55, clarification added). Consequently, the possibility that the standard taxonomy might not apply anymore in light of the hyper-nativist statements not only poses an incidental textual problem, but is also generates a major tension within the Cartesian system. If Descartes is genuinely collapsing adventitious ideas into the innate, and thus they are only adventitious in appearance, the external world is either made redundant or illusory. In both cases, the role of God is threatened by a hyper-nativist position: God is either seen as the creator of an ontologically overcomplicated world or as a deceiver that is no different from an evil demon. This would mean that, if the standard taxonomy is substituted by a hyper-nativist one, one should also be prepared for the collapse of deeply entrenched principles of Descartes’ thought. Needless to say, this is an extremely undesirable outcome. Within the literature, Nelson (2008), for example, has expressed concisely the general tension between hyper-nativism and moderate nativism in this way:

This (the tension) has led commentators to object that Descartes is attempting to mobilize innate ideas for at least two disjoint tasks. One is providing thinkers with cognitive contact with fundamental metaphysical truths. The other is underwriting the revolutionary, mechanical theory of sensory perception. The alleged muddle, then, consists in lumping the distinctly perceivable innate ideas (and their special epistemological role) together with the sensory ideas (and their special explanatory role in the theory of sensory perception (...)) This is one of the grounds for the general allegation that Descartes’ doctrine of innate ideas ends up muddled because he tried to accomplish too many inherently diverse things with it (Nelson 2008:322-3, clarification added)

This conclusion, however, might be premature. In the following sections I cast new light on Descartes’ descriptions of moderate and hyper-nativism, and I pursue a reconciling interpretation. This is not to say that Descartes offers a perfectly unified, tension-free theory of ideas, but rather that, although he could have sometimes expressed matters more sharply, his use of hyper-nativism is in consonance with the main Cartesian theses and, significantly, it reveals his attempt to account for the contribution of the mind in sensory perception. For a reconciling reading, it is possible that Descartes held a version of hyper-nativism without

discarding a non-trivial sense in which external objects cause adventitious ideas. In doing this, I join a group of interpretations in the literature that present ways to make the two taxonomies compatible to some extent, while preserving the causal role of the external world (Jolley 1990, Schmaltz 1997, Rozemond 1999, Nelson 2008, Boyle 2009). I will rely on some on their insights that will be pointed out accordingly. At the same time, I take a slightly different route in my reasoning. I start with a reconstruction of Descartes' argument for hyper-nativism in the following section. This textual analysis will serve as a platform for the upcoming reconciling interpretation.

1.2 THE ARGUMENT FOR HYPER-NATIVISM IN THE TEXTS

We have seen that Descartes offered a particularly clear instance of the thesis that all ideas are innate in the *Comments*, a short work published in early 1648, two years before his death in the court of Queen Cristina of Sweden. The Comments are his response to a pamphlet containing twenty-one articles published in 1647 anonymously by a former disciple of his, Henri le Roy (Henricus Regius), Professor of Medicine at Utrecht. The pamphlet was entitled 'An account of the human mind, or rational soul, which explains what it is and what it can be',⁸ and Descartes described it as being 'issued in the form of a broadsheet which can be fixed to church doors' and as expressing 'opinions which I judge to be positively harmful or mistaken' (AT VIII B 342/CSM I 294). After reading primarily the *Discourse*, the *Optics* and a copy of the unpublished manuscript of *The World*, Regius considered himself a proponent of Cartesian natural philosophy. Nevertheless, his writings would make clear to Descartes that there were important areas of disagreement (or, at least, of misunderstanding) between them. For instance, in 1641, Descartes had to urge Regius to change some of the theses he was presenting in Utrecht under the umbrella of Cartesian philosophy in order to

⁸ The original title reads: 'Brevis explicatio mentis humanae, sive animae rationalis: ubi explicatur, quid sit & quid esse possit'.

avoid the accusations of heresy that he had been careful to stay away from in the past.⁹ A deferential master-disciple exchange continued for a few years until Regius published his *Foundations of Physics* (1646) against Descartes' advice.¹⁰ In the preface to the French edition of the *Principles of Philosophy* (1647), Descartes accused Regius of having plagiarised his natural philosophy and of having distorted his metaphysics, 'on which the whole of physics must be based' (AT IXB 20/CSM I 189)¹¹. It was in response to those accusations that Regius published his pamphlet, thus prompting Descartes' point-by-point response in the *Comments*.

The exchange contains abundant points of disagreement. For the purposes of this project, I will focus exclusively on the dispute relating to the origin of the representational content of ideas, which is what induces Descartes' hyper-nativist claims. This debate stems mainly from an argument that Regius presented in articles 12 and 13 of his pamphlet. In them, he claimed that all that we come to know has its origin in experience and that, therefore, the mind simply does not need innate ideas. In the light of this empiricist stance, innate ideas are simply redundant. Regius' articles are the following:

(12) The mind has no need of ideas, or notions, or axioms which are innate: its faculty of thinking is all it needs for performing its own acts (AT VIII B 345/CSM I 295)

⁹ For instance, Descartes wrote to him in May 1641: 'In the first place, a Roman Catholic is not allowed to say that the soul in man is threefold; and I am afraid that people will impute to me the views expressed in your thesis. So I would prefer you to avoid this way of talking' (AT III 369/CSMK 181).

¹⁰ This is another excerpt of their correspondence, from July 1645. Descartes writes: 'I was completely astounded and saddened, both because you seem to believe such things and because you cannot refrain from writing and teaching them even though they expose you to danger and censure without bringing you any praise (...) I find it necessary to declare once and for all that I differ from you on metaphysical questions as much as I possibly could, and I shall even put this declaration into print if your book should see the light of day. I am indeed grateful that you have shown it to me before publishing it; but I am not grateful that you have been teaching its contents privately, without my knowledge' (AT IV 248-50/CSMK 254-55).

¹¹ 'Last year he (Regius) published a book entitled *The Foundations of Physics* in which, as far as physics and medicine are concerned, it appears that everything he wrote was taken from my writings - both from those I have published and also from a still imperfect work on the nature of animals which fell into his hands. But because he copied down the material inaccurately and changed the order and denied certain truths of metaphysics on which the whole of physics must be based, I am obliged to disavow his work entirely. And I must also beg my readers never to attribute to me any opinion they do not find explicitly stated in my writings' (AT IXB 20/CSM I 189, clarification added).

(13) Thus all common notions which are engraved in the mind have their origin in observation of things or in verbal instruction. (*ibid.*)

In direct response to these articles (recall that Descartes elaborates on a point-by-point response to Regius' pamphlet), he brings forward hyper-nativist claims. In their abbreviated versions, they contain an argument to the effect that 'there is nothing in our ideas which is not innate to the mind or the faculty of thinking', and that 'the very ideas of the motions themselves and of the figures are innate to us' (referring to the motion patterns transmitted through the nerves that form a figure—an isomorph—in the internal cavities of the brain). Again, given the moderate nativism presented in the *Meditations*, this passage contains an unexpected claim. Descartes seems to be endorsing a hyper-nativist position in response to Regius' empiricism. At this point, it is worth clarifying that, for Descartes, as well as for Regius, the senses provide crucial information. For instance, we have seen that the existence of the physical world is paramount to the itinerary of the *Meditations*. However, contrary to Regius, Descartes' way of emphasising the causal efficacy of the external world in the *Comments* is by reminding the reader of the fundamental dissimilarity between what constitutes the external object that we perceive, and the idea that it is formed in the mind as a result. This is no other than the familiar (PD), restated in the *Comments* in a way that mirrors, indeed, the treatment of dissimilarity in the *Treatise on Light* and in the *Optics*: 'in no case are the ideas of things presented to us by the senses just as we form them in our thinking' (AT VIII B 358/CSM I 304).

This time, however, Descartes draws from the (PD) what appears to be a more radical conclusion than the implications that he had (at least explicitly) contemplated in the past (particularly in the *Treatise on Light* and the *Optics*, following the textual analysis of Chapter One). His conclusion here is that precisely due to the (PD), adventitious ideas are to be considered innate. This is rather peculiar for at least two reasons. On one hand, by the time of the *Comments*, Descartes had already introduced the (PD) in many occasions, but this seemingly important consequence of it (hyper-nativism) had not appeared with it in the past (with the exception of the aforementioned letter to Mersenne from 1641). On the other hand, the hyper-nativist response is unusually strong given that Descartes was already familiar with versions of the empiricist position endorsed by Regius. It had been raised to him as an objection to the moderate nativism of the *Meditations* by Hobbes and Gassendi in the Third

and Fifth Sets of Replies respectively. Gorham (2002) has also pointed this out regarding the rejoinder in the *Comments*: ‘it would have been sufficient simply to enlist familiar arguments leading to a modest brand of innatism about the idea of God and certain notions, as he had done in his responses to Hobbes and Gassendi’ (2002:357).

For example, he responds to Hobbes’ rejection of innate ideas by pointing out the difference between imagination and intellect. He tells Hobbes that God is certainly ‘inconceivable’ in the sense that a human concept will never adequately represent ‘*him*’, but that the idea of God is nevertheless innate as a product of the intellect. He also reminds him that the term ‘idea’ does not only refer to imagistic ideas (‘images of material things that are depicted in the corporeal imagination’), but to anything that is perceived by the mind (Third Set of Replies, AT VII 188-89/CSM II 132). Also, Gassendi held a similar empiricism about the origin of all ideas that can also be identified in Regius’ twelfth and thirteenth articles. For he objects to Descartes: ‘as for the forms which you say are innate, there do not seem to be any: whatever ideas are said to belong to this category also appear to have an external origin’ (Fifth Set of Replies, *ibid.* 280/195). Descartes’s response contains an argument for the innateness of geometrical figures: ‘when in our childhood we first happened to see a triangular figure drawn on a paper, it cannot have been this figure that showed us how we should conceive of the true triangle of the geometers’ (*ibid.* 382/262). To Gassendi’s charge that the idea of God is formed by amplifying properties that we acquire by the senses, he replies again with a distinction between the products of ‘imagination’ and those of ‘understanding’ (here standing for ‘intellect’ (*ibid.* 364-6/251-2). In both sets of Replies, Descartes’ claims are led by the notion of innateness that appears in the standard taxonomy. The examples that he employs (God and geometrical notions) are archetypical of a moderate nativist account.

In the *Comments*, Descartes constructs an argument in favour of innateness that is significantly different. His response stems from what he takes to be the ‘extraordinary conclusion’ contained in article thirteen of Regius’ pamphlet, that is, that if all common notions that exist in the mind are given by the senses, this would be the same as to say that the mind cannot do

anything on its own.¹² Descartes' response is constructed through an appeal to the (PD) that is supposed to show that, given that what the external objects provide is only motion patterns, the mind, in fact, has quite a lot of work to do by itself. The opening statement for his reasoning emphasises precisely this fact. To Regius' claim that 'the power of thinking could not achieve anything on its own', he responds with a clear 'on the contrary'. This is the passage that has been already cited in §1 above, now in better context:

This (that the power of thinking cannot achieve anything on its own) is so far from being true that, *on the contrary*, if we bear in mind the scope of our senses and what it is exactly that reaches our faculty of thinking by way of them, we must admit that in no case are the ideas of things presented to us by the senses just as we form them in our thinking. So much that there is nothing in our ideas which is not innate to the mind or the faculty of thinking (AT VIII B 358/CSM I 304, clarification and emphasis added)

It is important to note that here Descartes identifies hyper-nativism, as a consequence of the (PD), as a reply to Regius' claim about the 'power of thinking not being able to do anything on its own'. The 'contrary' of an inefficacious mind, in this passage, seems to be a mind that is capable of bridging the qualitative gap captured by the (PD). The argument can be reconstructed as follows:

- (P1) In sensory perception, nothing reaches the mind except for an isomorphic representation of the geometrically reduced properties of objects that is formed in the brain.
- (P2) Ideas of external objects have a qualitative character that cannot be identified with the quantifiable nature of their physical causes (the isomorphic representation in the brain as well as what constitutes the external object itself).

¹² Descartes interprets Regius as thus: 'In article thirteen he draws an extraordinary conclusion from the preceding article. Because the mind has no need of innate ideas, its power of thinking being sufficient, he says, 'all common notions which are engraved in the mind have their origin in observation of things or in verbal instruction'- as if the power of thinking could achieve nothing on its own, could never perceive or think anything except what it receives through observation of things or through verbal instruction, *i.e.* from the senses' (AT VIII B 358/CSM I 304).

- (C) Therefore, qualities exhibited by ideas are supplied by the mind *i.e.* they belong to the category of mental content that we call ‘innate’.

This argument is restated three times in the *Comments* (one for every time that Descartes mentions hyper-nativism). Significantly, it is also the same argument that Descartes sketched in the letter to Mersenne: ‘the sense-organs do not bring us anything which is like the idea which arises in us on the occasion of their stimulus, and so this idea must have been in us before’ (AT III 418/CSMK 187). Now, on the basis of the analysis of this chapter, we can at least make sense of one aspect of Descartes hyper-nativism. Specifically, that it appears as the necessary outcome of the (PD) between mechanistic explanations and mental representations and, in that, it fills the same space that in previous occurrences of the (PD) was occupied by suggestions of mental activity. Due to this equivalence, I take the following claim to be a plausible hypothesis at this point: namely, that Descartes used a widened category of innateness as a late strategy (post-*Meditations*, to be precise) for accounting for a type of mental content that appeared in his naturalistic account of sensory perception.

In Chapter Two I argued that Descartes held a causal-semantic model of sensory perception in which the activity of the mind is that of a decoder of natural semantic correlations. All the details of the model do not need to enter here, but recall that the mind exercises its own causal efficacy by interpreting meaningful correlations between a natural sign and a significatum. This means, in other words, that the mind brings about a type of content through its own causal efficacy. Importantly, the sorts of contents that are characterised by being produced by the mind are, across Descartes’ thought, precisely the ones that receive the designation ‘innate’. Descartes made a patent effort in mapping a taxonomy of the mind, but it is also true, at the same time, that the type of mental content that appears in his doctrine of sensory perception is the most elusive and complex (as we saw in Chapter Two). Certainly, the label of ‘innateness’ is perhaps confusing, and Descartes could have elaborated on the glaring tension that it might generate when it is applied to ideas of sense. This does not amount, however, to a pessimist conclusion regarding Descartes’ theory (or theories) of ideas. In what follows I assist Descartes in the reconstruction of what I take to be his reconciling position between hyper-nativism and moderate nativism. I do this, in the next section, by recasting the rationale behind the two classifications of ideas that Descartes puts forward.

SECTION 2. RECONCILING TAXONOMIES OF IDEAS

So far, I have presented the argument Descartes offers in favour of hyper-nativism, both in the *Comments* and in the 1641 letter to Mersenne. I have argued that the (PD) is at the core of Descartes' response and that this shows that his appeal to innateness is a strategy for accounting for the type of mental content that figures in his theory of sensory perception. Now, for this interpretation to stand on solid grounds, one needs to address the major tensions specified above. That is, if hyper-nativist statements are to be taken as genuine, what happens with the foundational standard taxonomy? And, in turn, what does one make of the role of the external world in this philosophical scenario? In this section I analyse the rationale of Descartes' differing taxonomies of ideas with the purpose of showing that they are compatible. To this end, I start with a short preliminary concerning two interpretative requirements.

2.1. PRELIMINARY: INTERPRETATIVE REQUIREMENTS

A tempting solution for reconciling the hyper-nativism with the standard taxonomy would be to downgrade hyper-nativism to a simple claim about the fact that, within Descartes' ontology, all ideas are modes of mind as opposed to modes of extension. Then, when Descartes says that 'there is nothing in our ideas which is not innate to the mind' (AT VIII B 358/CSM I 304), he must only mean that adventitious ideas, much like any other type of idea, belong to the thinking substance, rather than to the extended substance. This possible way out of the tension between taxonomies takes in a distinction that appears in the Preface to the *Meditations* between ideas taken 'materially' and ideas taken 'objectively' (AT VII 8/CSM II 7). From the perspective of their material reality, all ideas (regardless of what they are ideas *of*) are mental acts. Following the terms of Cartesian ontology, they are modes of thought, which in turn is the attribute of the finite substance of mind. However, something peculiar to ideas (as opposed to modes of extension) is that they can be *about* something. That is to say, they have representational content. Taken objectively, an idea is 'the thing

represented by that operation' (*ibid.*). To read this distinction into Descartes' hyper-nativism would provide a rather effortless solution.

However, it would be as effortless as it is textually unjustified. In the *Comments*, Descartes is concerned with the content of ideas, not with their status as mental operations (Schmaltz 1997:38). We have seen that hyper-nativism enters in the *Comments* as the direct consequence of the fundamental dissimilarity between mechanistic explanations and mental representations—that is, the (PD). The (PD), crucially, is a problem of representational content, and it is not concerned with ideas *qua* mental acts, but with the origin of the content of those mental acts that we call sensory ideas. In the *Comments* and in previous works, the (PD) is accompanied by a description of the process of sensory perception in which the mind can hardly be seen as a passive receiver of inputs from the body. Recall, most notably, that in the *Optics* he writes that the mind is 'stimulated' ('excitée'), and that the isomorph formed in the brain 'gives means to the mind' ('donner moyen'). In the *Comments*, the terminological balance (which I singled out in Chapter One) reappears: 'on the occasion of certain corporeal motions, our mind is to be capable of representing them (sensory ideas) to itself' (AT VIII B 359/CSM I 304). Therefore, I take the first interpretative requirement for a reconciliation of taxonomies to be the following:

(A) An interpretation of Descartes' hyper-nativism should preserve a meaningful sense in which adventitious ideas are innate, that is, a sense that is not equivalent to ideas taken materially.

Now, given the importance of the (PD), one could be tempted to travel to the other end of the spectrum of interpretations and renounce to the standard taxonomy altogether, therefore making *all* ideas innate in a meaningful sense. But that would also be a mistake. As seen in section §1.1, the standard taxonomy is a decisive component within the method of doubt and the price for giving it up is simply too high. A charitable commentator, I believe, should try to retain a sense in which, in agreement with the *Meditations*, bodies are genuine causes of adventitious ideas. Furthermore, the *Comments* provide, as a matter of fact, textual support for maintaining the standard taxonomy. Interestingly, right before the hyper-nativist claims that I have sketched before, Descartes restates as valid the familiar taxonomy:

I did, however, observe that there were certain thoughts within me which neither came to me from external objects nor were determined by my will, but which came solely from the power of thinking within me; so I applied the term ‘innate’ to the ideas or notions which are the forms of these thoughts in order to distinguish them from others, which I called ‘adventitious’ or ‘made up’ (AT VIII B 358/CSM I 303)

So there is strong textual motivation for maintaining the standard taxonomy even at the stage of the *Comments*. It is unlikely, I believe, that Descartes would ratify it and then abandon it immediately after in the same text. It is also important to note, as I have mentioned before, that his hyper-nativist statement in the letter to Mersenne happens in 1641, the year of the publication of the *Meditations*. For these textual reasons, I take the second interpretative requirement to be as follows:

(B) An interpretation of Descartes’ hyper-nativism should keep, at the same time, the standard taxonomy, thereby preserving a genuine sense in which bodies are causes of adventitious ideas.

Now that the interpretative requirements have been established, I offer in the next section what I take to be a more promising strategy for solving the textual and philosophical problems posed by hyper-nativism. I will assess the two taxonomies of ideas and identify a difference in their rationale. To be precise, I will contend that they are directed to two different causal questions about ideas.

2.2. TWO CAUSAL QUESTIONS ABOUT IDEAS

A common interpretation of the standard taxonomy of the *Meditations* states that the criterion for constructing the clear-cut distinction between adventitious, factitious, and innate ideas is the source that accounts fully for their production.¹³ This includes a claim about their causal origin, as well as a claim about the source of their representational content. Adventitious

¹³ General treatments of Descartes’ theory of ideas include claims to this effect. See, for instance, Williams (1978), Hatfield (2003), and Smith (2013).

are fully accounted for by the external world ('things which are located outside me') innate ideas by sole activity of the intellect ('my own nature'), and factitious ideas by the faculty of the will ('my own invention'). A reading of the rationale of the standard taxonomy as including a claim about the source of representational content of ideas is difficult (if not impossible) to couple with hyper-nativist statements that are also, as we have seen, about representational content. Either adventitious ideas get their representational content from the external world, and that is precisely what makes them adventitious, or they get their representational content from the mind and that is what merges them with the innate. Indeed, the standard taxonomy seems to be constructed in such a way that the three categories are not only 'exhaustive but exclusive – that is to say, no idea could belong to more than one of them' (Williams 1978:118). I intend to challenge this common reading of the taxonomy by showing that the rationale of the standard taxonomy is concerned with the production process of ideas rather than with the origin of their representational content. I flesh out this reasoning in the next paragraphs.

As a starting point, I agree with Jolley's useful analysis that Descartes' theory of ideas, in its fundamental form, is an explanatory theory about classes of occurrent thoughts. In other words, in constructing each of the three categories (adventitious, factitious, and innate), he is giving a 'possible answer to a causal question' about ideas (1990:33)¹⁴. It is not only useful, but also textually accurate, to approach the standard taxonomy without an assumption about representational content, but rather from a more general standpoint about causality. In the text, Descartes does not explicitly address 'content' (and he does not mention ideas 'taken objectively'). Rather, he frames the discussion with more general causal claims. We are told that ideas 'come from' ('procedere') and 'derive' from different sources, and that one of the tasks of the meditator will be to 'perceive their true origin' (something that is still not possible in Meditation Three, given that the existence of external world will be uncertain until Meditation Six). In order to reconcile taxonomies, the causal question implicit in the taxonomy of Meditation Three needs sharpening. To look for a causal source is not equivalent

¹⁴ Jolley (1990) goes on to assert that Descartes conceived of innate ideas as having their causal source in a dispositional property of the mind. He does not assess, however, how focusing on the causal question instead of directly on representational content might affect the taxonomy, or how can one couple it with hyper-nativism.

to looking for a source of representational content, and it is certainly not the same as to look for the *only* source of representational content. Descartes does not specify the precise causal question underpinning the taxonomy, and whereas formulating it in terms of representational content clashes with his parallel hyper-nativism, a different causal claim might preserve higher textual consistency.

The causal claim at stake, I suggest, concerns the faculty that initiates the causal mechanism by which an idea is formed in the mind. This is what causal or ‘true’ origin means in the *Meditations* (AT VII 38/CSM II 26). That is to say, what determines the category to which ideas belong to (adventitious, factitious, or innate) is not their representational content, but the faculty in which we locate the causal origin of its production process. Following this reading, then, some ideas are adventitious because their production process is set off by an external object, some ideas are innate because their production process is set off by the sole activity of the mind, and some ideas are factitious because their production process is set off by the will. A similar story is told in the part of the *Comments* where Descartes restates the standard taxonomy. There, the emphasis is also on the distinction between the three faculties that set off the different production processes:

There were certain thoughts within me which neither *came to me* from external objects nor were determined by my will, but which *came solely* from the power of thinking within me (AT VIII B 358/CSM I 303 emphases added).

Therefore, my point is that, on one hand, it is plausible that the criterion that constructs the taxonomy of Meditation Three is not a difference in representational content. Rather, it is concerned with the faculty that initiates a causal process that culminates with the formation of an idea in the mind. On the other hand, we have observed that Descartes’ focus on the (PD) justifies a reading of the hyper-nativist statements as being about representational content of ideas. In the *Comments*, then, the hyper-nativist taxonomy is shaped by a question about representational content, not about faculty origin. The two taxonomies of ideas that Descartes presents (the moderate nativist and the hyper-nativist) have different results, then, because they answer different causal questions. This means that Descartes cannot be charged with providing two mutually exclusive classifications of ideas. At this point, it is charitable to consider that Descartes did not attempt ‘to accomplish too many inherently diverse things’

with the category of innateness (Nelson 2008:323).¹⁵ Concisely, these are the two causal questions underlying the taxonomies:

1. The first question is brought about by a general causal query that finds its place within the itinerary of the *Meditations*. The meditator notices that she is a ‘thinking thing’ that has a variety of ideas, and that is what prompts an investigation concerning their origins that allows for the method of doubt to go forward. This general causal query will reach the conclusion that there are three different causal origins located in three different faculties that initiate causal processes: the world, the will, and the intellect.

2. The second, hyper-nativist taxonomy is the answer to a different causal question motivated by one of Descartes’ main philosophical worries, that is, the (PD). As we have seen, the fact that adventitious ideas are dissimilar to their causes does not pose, for Descartes, a problem of interaction between finite substances *qua* substances, but an explanatory problem involving the specifics of the given fact of body-to-mind interaction. The causal question, in this case, concerns where ideas get their representational content from, given the phenomenon of dissimilarity.¹⁶ This question will reach a different outcome: given the (PD), the source of representational content of *all* ideas is the mind.

Then, this variation in the criterion for Descartes’ classifications of ideas produces the following compatible definitions of innateness. In the standard taxonomy, we encounter the first meaning:

¹⁵ Here I refer to Nelson (2008) because of his particularly succinct exposition of the tensions that hyper-nativism introduces in the Cartesian system. This is a reference to a longer quotation in §1.1. Just to be clear, Nelson does think that it is possible to square both classifications of ideas. Ultimately, though, he endorses the view that, while there are only a few innate ideas (as specified in the *Meditations*, for example), these ideas inform, or make intelligible the specific adventitious ideas that we form. De Rosa (2010) also sympathises with this reading of innateness along the lines of intelligibility.

¹⁶ I will explore in more depth the second rationale (source of representational content) in the following, final section.

(IN₁) An idea is innate if the causal process that culminates in its formation is set off by the pure intellect.

In the *Comments*, we are presented with the second meaning:

(IN₂) An idea is innate if the total or partial source of its representational content is the mind.

Before moving on to examine the implications of these two definitions for Descartes' theory of sensory perception, I provide some additional textual grounds for the distinction between the two causal questions.

To begin with, there is a notable motivation for reading the standard taxonomy as involving *only* a question about faculty origin. Crucially, if the meditator were to classify the types of ideas in terms of the source of their representational content, the outcome of such an exercise would not be the standard taxonomy as we know it. The reason lays in the category of factitious ideas. Factitious ideas are a result of our will and are put together by the imagination, but the origin of their representational content is the same as adventitious ideas. They work, one could say, with the same *materials*. In her monograph about Descartes on innate ideas, Boyle has most recently brought attention to this fact: 'Descartes' examples of his ideas of sirens and hippogriffs, suggest that factitious ideas are compositions of ideas that seem to come to him through the senses, and thus that factitious ideas are parasitic on adventitious ideas' (2009:38).¹⁷ To consider that the standard taxonomy is about representational content merges adventitious and factitious ideas into the same category and, consequently, the taxonomy is dissolved. By making the taxonomy about the faculty that initiates a causal process (the details of which are not specified by the taxonomy), the three categories are preserved. While the causal mechanism that generates adventitious ideas is initiated by an external object, the causal mechanism that ends with factitious ideas is prompted by the will.

¹⁷ Boyle (2009) does not elaborate, however, on a possible reinterpretation of the rationale behind the taxonomy.

Finally, I make a couple of smaller textual points concerning the difference between the two causal questions. First (i), by taking a careful look at the texts, it is possible to notice the two causal questions as separate. Although Descartes did not offer a forthright distinction between them, one can detect how in the *Meditations* the validity of the standard taxonomy is not affected by the issue of dissimilarity between adventitious ideas and their causes, which is an issue that appears repeatedly. Immediately after the first appearance of the taxonomy in Meditation Three, Descartes goes on to examine why the reasons for the belief that adventitious ideas reveal the basic physical properties of objects are inadequate (Hatfield 2003:154). It is noteworthy that the transition between the two issues is marked by a clear change of question: ‘But the chief question at this point concerns the ideas which I take to be derived from things existing outside me: what is my reason for thinking that they resemble these things?’ (AT VII 38/CSM II 26).

Second (ii), it is also important to note that there is no claim in the *Meditations* to the effect that the production of representational content of each category of ideas is confined to one faculty exclusively. This means, I suggest, that the standard taxonomy does not rule out a more elaborate causal story about the configuration of adventitious ideas. In the context of the argument of the *Meditations*, the standard taxonomy has the significant aim of tying certain common inclinations or ‘propensities’ of ours to a foundational metaphysical truth about the causal origin of ideas, that is, the existence and causal efficacy of the external world. This, in turn, points to God’s benevolence, as it is clear from the proof of Meditation Six.¹⁸ That is to say, God would not create an illusory or redundant world. In sum, the standard taxonomy does not seem to be introduced as a detailed, naturalistic story about the configuration of each type of ideas. In this specific sense, one could even think that the definition of innateness is peculiar in the *Meditations*, not in the *Comments*. Descartes advances the partial causal story contained in the taxonomy for an important tactical reason in the itinerary of the *Meditations* which, at the same time, confirms their causal origins in

¹⁸ ‘For God has given me no faculty at all for recognising any such source of these ideas; on the contrary, he has given me a great propensity to believe that they are produced by corporeal things. So I do not see how God could be understood to be anything but deceiver if the ideas were transmitted from a source other than corporeal things’ (AT VII 79-80/CSM II 55).

three different faculties. This is something that does not change throughout the Cartesian corpus.

Charitably, it is also the case that Descartes provide a few details of the naturalistic process of sensory perception in Meditation Six, and these are in consonance with his treatment of body-mind interaction in other works. For instance, amid his argument for the union of the mind and the body, he writes that ‘any given movement occurring in the part of the brain that immediately affects the mind produces just one corresponding sensation (...) this motion, by way of the spinal cord, reaches the inner parts of the brain, and there gives the mind its signal for having a certain sensation...’ (*ibid.* 87-8/60). The *Meditations*, however, are not the place that Descartes envisaged for considering the intricacies of body-mind interaction (that is, sensory perception) and, consequently, the implications of the (PD).

All in all, I believe that the analysis provided in this section provides a plausible reconciling answer for the presence of two different classifications of ideas in Descartes’ works. Furthermore, by interpreting Cartesian hyper-nativism as stemming from a question about the source of representational content of ideas, this reading preserves the first textual requirement sketched above. It was the following:

(A) An interpretation of Descartes’ hyper-nativism should preserve a meaningful sense in which adventitious ideas are innate, that is, a sense that is not equivalent to ideas taken materially.

Certainly, innateness as in (IN₂) is not concerned with ideas taken materially, but objectively (insofar as they are *about* something). In this section I have offered an alternative reading of the taxonomy of ideas that Descartes presents primarily in the *Meditations*. This interpretation eliminates the alleged textual tension by showing that it is possible to encounter two coexisting classifications of ideas in the texts because there are two different causal questions underpinning them. After determining the rationale of the standard taxonomy, now I look in finer detail at the question about representational content behind Descartes’ hyper-nativism. While doing it, I address how this reading meets the second interpretative requirement. That is, I show that it preserves a non-trivial way in which external objects are genuine causes of sensory ideas.

SECTION 3. AN INNATENESS STRATEGY FOR A PROBLEM OF REPRESENTATIONAL CONTENT

In the previous sections, we have seen that Descartes' theory of ideas aims at answering, at least, two causal questions, and that the appearance of each question is dependent on textual context. I have focused on the taxonomy that is primarily presented in the *Meditations* in order to show that it is not established by a distinction of origins of representational content, but instead by a distinction between the faculties that initiate a causal process (the external world for adventitious ideas, the intellect for innate ideas, and the will for factitious ideas). The upshot of this is that the taxonomy of Meditation Three provides only a partial account of the causal process of the formation of ideas. What appears in the *Comments*, then, is a story about representational content that is in line with Descartes' previous claims about mental activity in sensory perception. Given the (PD), the mind must operate as a source of representational content of sensory ideas. I finished the previous section by remarking that my reading conforms to the first interpretative requirement (A).

In this final section, I look at the implications of the two definitions of innateness that emerge from a revised analysis of Descartes' classifications of ideas. I intend to finish my interpretation by showing that it also preserves the second interpretative requirement (B). That is, I argue that, despite his qualified hyper-nativism, Descartes maintained the causal role of bodies in the production of sensory ideas. I will proceed in two stages, corresponding to two brief sections. First, I assess how to understand Descartes' hyper-nativist claims within his standard taxonomy of the mental. I focus on a short exposition of the faculties of the mind. Second, I make a case for considering sensory ideas as 'innate yet adventitiously conditioned'.

3.1. FACULTIES OF MIND

A reconciling story for the two taxonomies of ideas has not gone without scrutiny in the literature. The view that Descartes introduced (at least) two meanings of innateness has been endorsed by some commentators in different ways. To my knowledge, Rodis-Lewis

(1950:84) is once more the pioneer of the interpretation. Williams (1978) distinguished between a ‘strong’ and a ‘weak’ sense in which ideas can be innate. Clarke (1983:50-2) made a distinction (compatible with mine) between innate ideas₁ that are ‘irreducible to the type of reality which triggers them’ and innate ideas₂ that ‘are independent from experience’. Schmaltz (1997) has offered a similar distinction that has, nonetheless, more textual grounds than its predecessors. He claims that Descartes holds two compatible senses in which an idea can be innate: a ‘narrow’ sense and a ‘broad’ sense. On one hand, ideas are innate in the narrow sense if they derive from the intellectual faculty of mind instead of the sensory or volitional faculty. On the other, ideas are innate in the broad sense when they are produced by *any* mental faculty (1997:40). The broad sense is, then, what determines the hyper-nativism of the *Comments*. I agree with Schmaltz’s classification on the whole. As a matter of fact, the two definitions of innateness that I have derived from the *Meditations* and the *Comments* respectively square well with what he calls ‘narrow’ and the ‘broad’ senses of innateness. Nevertheless, I do think that the grounds for the theory trace back, in fact, to a difference amongst the rationale behind each taxonomy, and this is something that Schmaltz does not refer to. These are, then, the two qualified definitions of innateness that Descartes is employing:

(IN₁) An idea is innate if the causal process that culminates in its formation is set off by the intellect. This conforms to a ‘narrow’ sense of innateness insofar as innateness is defined by opposition to external objects and to another faculty of the mind (*i.e.* the will).

(IN₂) An idea is innate if the total or partial source of its representational content is the mind. This definition matches with a ‘broad’ sense of innateness because it allows for an innate idea to be at least partially formed by any faculty of the mind.

But what does it mean that, according to Descartes’ hyper-nativism, ideas are innate because they can be at least partially formed by *any* faculty of mind? First of all, note that the faculty of the intellect is not mentioned in the second definition, while it does appear in (IN₁). While a distinction between faculties is what emerged from the analysis of the standard taxonomy of the *Meditations*, in the *Comments* the reference is to the mind in general. In order to understand these claims, we need first to look briefly at Descartes’ taxonomy of the mental.

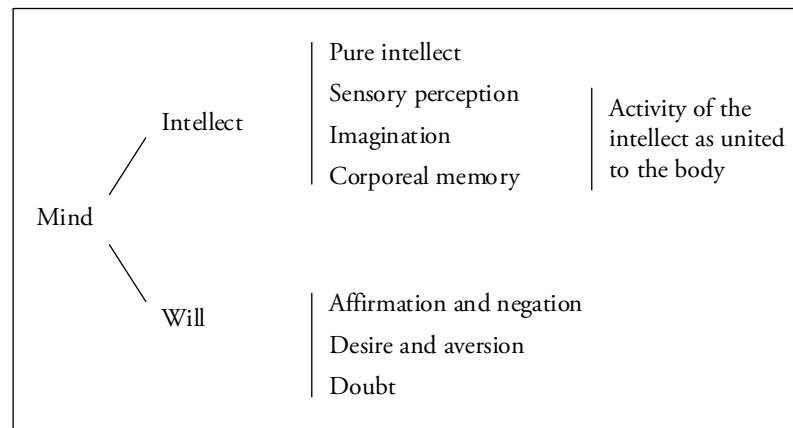
According to Descartes, the mind has only two faculties: the intellect and the will. While the function of the intellect is to become aware of ideas as mental contents (to ‘perceive’ ideas, in Cartesian terms), the will has the capacity to act upon these contents (for example, by declaring whether they are true or false).¹⁹ In turn, these faculties have other modes (or modifications of the attribute of thought). The intellect has four modes: pure intellect, sensory perception, imagination, and corporeal memory (see Fig.4 below). The will provides modes such as affirmation, negation, and others.²⁰ Let us focus on the modes of the intellect. The main characteristic of the pure intellect is that its activity is completely independent from the body. It is, therefore, the mode of intellect that appears in (IN₁). In the sense of innateness that structures moderate nativism, ideas are innate when their production process is set off precisely by the pure intellect. As a result, we can form a limited range of ideas, namely, the ideas of God, eternal truths, and fundamental logical axioms.

Nevertheless, not all intellectual activity is of this sort. Descartes also derives from the general faculty of intellect three other modes that do require the presence of the body. In this regard, sensory perception, imagination, and corporeal memory are ‘special modes of thinking’ (MM AT VII 78/CSM II 54). Presumably, then, the doctrine leaves room for a special mode of thinking that also belongs to the mind in a qualified sense. It belongs to the mind *as* united to the body.²¹

¹⁹ Meditation Four contains a clear exposition of the two faculties, in the context of determining the source of error: ‘All that the intellect does is to enable me to perceive the ideas which are subjects for possible judgments; and when consider strictly in this light, it turns out to contain no error in the proper sense of that term (...) the will simply consists in our ability to do or not do something (that is, to affirm or deny, to pursue or avoid); or rather it consists simply in the fact that when the intellect puts something forward for affirmation or denial or for pursuit or avoidance, our inclinations are such that we do not feel we are determined by any external force’ (AT VII 56-57/CSM II 39-40, see also Pr I 32, 34).

²⁰ Pr I 32, AT VIIIA 17/CSM I 204

²¹ This claim also appears clearly in some of Descartes’ correspondence. For instance, he writes to Guillaume Gibieuf: ‘I do not see any difficulty in understanding on the one hand that the faculties of imagination and sensation belong to the soul, because they are species of thoughts, and on the other hand that they belong to the soul only in so far as it is joined to the body’ (19th January 1642, AT III 479/CSMK III 203).

Figure 4. *Descartes' taxonomy of the mental*

Now, we know from the argument for hyper-nativism that Descartes believes that the ‘special mode of thinking’ that is sensory perception requires the contribution of the mind for forming the representational content of ideas. Otherwise, we could not account for the qualitative character of our sensory experience. In line with the above taxonomy of the mental, this means that the mind provides content, but not by virtue of the activity of the pure intellect. Hence, the kind of innate ideas involved in sensory perception are not the reduced group associated with moderate nativism. The sense of innate ideas at stake is (IN₂).

3.2. INNATE IDEAS AS ADVENTITIOUSLY CONDITIONED

Given all these points, what does one make of the role of the bodily cause? On one hand, the rationale identified behind the standard taxonomy of the *Meditations* does not prevent a more elaborate causal story for sensory ideas. It only tells us the beginning of that story —the production of adventitious ideas starts, genuinely, with an external object impacting the sense organs. On the other, what underpins Descartes’ hyper-nativist claims is a sense of innateness that can tell us a bit more about that causal story: the representational content of adventitious ideas comes (fully or partly) from the mind.

This points to a causal process in which bodies act as triggers rather than transmitters of ideas (Gorham 2000:362).²² A reading of the *Comments* as offering a version of a ‘triggering model’ has been endorsed, for example, by Williams (1978), Schmaltz (1997), and Rozemond (1999).²³ In a triggering model, the role of the body is to explain the ‘*occurrence* of particular sensory ideas at a particular time. It explains why the mind’s disposition to form a particular type of sensory idea is activated at one time rather than another’ (Rozemond 1999:458). The view that the external object is simply a trigger for the mind’s own causal efficacy receives support from Descartes’ relatively frequent talk of brain states as ‘occasions’ for the mind to form an idea. Crucially, this is a point that appears in the *Comments*:

The ideas of pain, colours, sounds and the like must be all the more innate if, *on the occasion* of certain corporeal motions, our mind is to be capable of representing them to itself, for there is no similarity between these ideas and the corporeal motions (AT VIII B 359/CSM I 304, emphasis added)

A triggering model is an attractive answer because it deals nicely with some of the varying terminology that Descartes employs for describing brain-mind interaction in sensory perception (for example, ‘occasion’ and ‘stimulation’). Besides, as we have seen, it fits well with the hyper-nativist claims of the *Comments*. If bodies are triggering causes of ideas in this sense, it means that the representational content of ideas is produced by the mind in full. Within triggering models, innate ideas, in the sense of (IN₂), are called ‘adventitiously elicited’. Finally, this reading also complies with the second interpretative requirement that was singled out above:

(B) An interpretation of Descartes’ hyper-nativism should keep at the same time the standard taxonomy, thereby preserving a genuine sense in which bodies are causes of adventitious ideas.

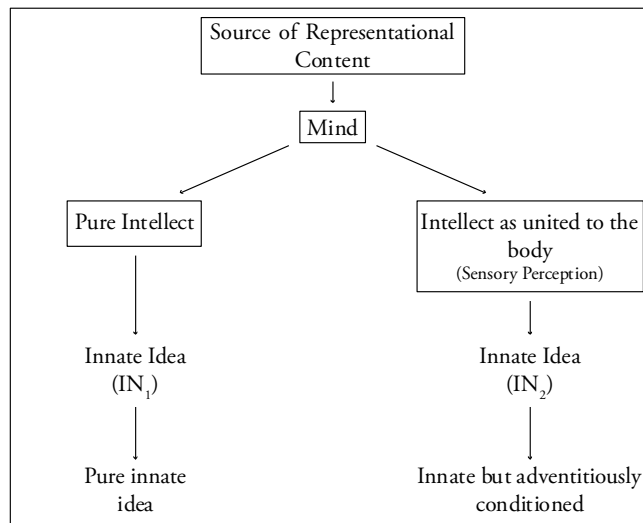
²² Gorham claims that it is not clear why Descartes needs a triggering model at all to explain the time of occurrence of ideas. He claims that ‘this can be adequately explained simply by the fact that God has established a nomological correlation between brain states and the ideas that arise on their occasion’ (2000:363). I think that this reading is incorrect. It fails to acknowledge Descartes’ terminological effort in depicting brain-mind interaction as a process grounded on the powers of the human brain and the human mind. More technically, it does not identify the methodological policy of ‘Qualified Explanatory Naturalism’ that I presented in Chapter Two.

²³ Nevertheless, as we will see shortly, Rozemond (1998) also takes into consideration some Cartesian claims that suggest that sensation is *more* than bodies triggering minds.

However, as I see it, the above version of a triggering model has a bit of a disappointing air. If bodies (and, by extension, brain states) are only contentless triggers, the presence of the external world (though not being redundant) is so minimally efficacious that one wonders whether that is what Descartes wants to be saying about God's perfect Creation. This picture of sensory perception opens a gap between object, body, and mind that almost resembles the 'sailor in a ship' scenario that Descartes warned against in Meditation Six:

Nature also teaches me, by these sensations of pain, hunger, thirst and so on, that *I am not merely present in my body as a sailor is present in a ship*, but that I am very closely joined and, as it were, intermingled with it, so that I and the body form a unit. If this were not so, I, who am nothing but a thinking thing, would not feel pain when the body was hurt, but would perceive the damage purely by the intellect, just as a sailor perceives by sight if anything in his ship is broken (AT VII 81/CSM II 56 emphasis added)

Certainly, the notion of the 'union of mind and body' is rather obscure in Descartes' works, but perhaps we can learn something from it about Descartes' views on the status of sensation and the role of bodies. According to Descartes' taxonomy of the mental (Fig.4 above), there are in the mind certain contents that seem to be bodily induced acts of the intellect, or acts of the intellect *insofar* as it is united to the body. Then, given that sensory ideas are these kinds of contents, it can be said that they belong exclusively to the metaphysical entity (the union of mind and body) that is the human being. For Descartes, sensory ideas, certainly, exhibit a representational content that cannot be fully accounted for by the motions in external objects. But at the same time, this type of representational content is exclusive to the unique type of interaction between *a human body* and *a human mind*. In other words, amongst possible qualitative products partially caused by bodies, it is a qualitative product unique to human beings. This is why, rather than 'innate yet adventitiously elicited', I am inclined to call sensory ideas 'innate yet adventitiously *conditioned*'. The pattern of motions in the brain might not contribute to the actual content of ideas, but it might determine more than its time of occurrence. A body (by means of a human brain) elicits in a human mind a type of response that is peculiar to *their* interaction. This can be illustrated as in Fig.5 below.

Figure 5. *Sources of representational content*

Descartes is not very explicit about this matter. Nonetheless, there are a few meaningful passages that can at least give us a glimpse into it. In her monograph about Descartes' dualism, Rozemond (1998), has devoted some attention to the topic of the ontology of sensation, while also pointing out that the issue is a bit muddled because of Descartes' vagueness.²⁴ In any case, she brings to the attention of the reader some passages that illustrate 'Descartes' dualistic view of sensation with a twist', as she puts it (1998:187). Just above, in the quotation from Meditation Six, he hints at this notion by saying that if human beings were not a genuine union they 'would not feel pain when the body was hurt, but would perceive the damage purely by the intellect, just as a sailor perceives by sight if anything in his ship is broken' (AT VII 81/CSM II 56). Similarly, bodies could act simply on other beings—disembodied minds like angels, for example—but the qualitative result would also be different. Upon hearing a sound, for instance, an angel would form an adventitious idea the content of which would be motions of differently sized particles. To this regard, Descartes writes (precisely) in a letter to Regius: 'sensations such as pain are not pure thoughts of a mind distinct from a body, but confused perceptions of a mind really united to a body. For if an angel were in a human body,

²⁴ For example, she writes about 'trialistic' interpretations of the substantial union, according to which the special union of the human mind and the human body counts as a third substance. Cottingham has also provided grounds for this reading (1985, 2008). I do not focus on these accounts for the purposes of this project. Nonetheless, in my treatment of the status of secondary qualities in Chapter Four I will address again the topic of the ontological status of sensation.

he would not have sensations as we do, but would simply perceive the motions which are caused by external objects, and in this way would differ from a real man' (January 1642, AT III 493/CSMK III 206). A human being, on the contrary, would experience a sound in the qualitatively human way —say, as a song as we know it.

Before finishing, I shall note here again that the interpretation presented in this chapter does not constitute an explanation of sensory perception that is a replacement for the causal-semantic model presented in Chapter Two. The designation of adventitious ideas as 'innate yet adventitiously conditioned' is a further characterisation (from the perspective of a taxonomy of ideas) of the sensory ideas that in a causal-semantic model are rightly recognised as semantic responses from the mind. Moreover, regarding this last section, a causal-semantic model could, on the face of it, accommodate better a sense in which bodily causes are not simply triggers that give the mind a 'time' for activating a specific instance of qualitative response. In a causal-semantic model, the state of the (human) brain is a natural sign. By standing in a sign-significatum relation with the object, a certain brain state is 'meaningful' for the mind. So the mind is not simply activated —the mind, first and foremost, *interprets*.

Certainly, bodies are more 'triggers' than 'transmitters', especially if one bears in mind Descartes' rejection of the standard Aristotelian-Scholastic theory of sensory perception. In this particular sense, Descartes was committed to eliminate the notion that bodies transmit actual immaterial forms of themselves ('sensible species') to perceivers. But with a different intention, he put forth a different sense of 'transmission' that was envisaged as purely naturalistic. In its corporeal part, we have seen that Descartes develops an early-modern, micro-corpuscular version of neural transmission of sensory inputs. For the mental phase of the process, the mind acts as an interpreter of that coded neural information. Descartes' causal-semantic model provides a triadic picture that is able to capture better the fundamental, uninterrupted unity between world, brain, and mind.

CONCLUDING REMARKS

In this chapter, I have offered an interpretation of Descartes' claims in the *Comments* regarding the innateness of all ideas. Hyper-nativism has been proven to be compatible with the moderate nativism that is commonly associated with Descartes' theory of ideas. My main point has been that Descartes introduces the category of innateness as a strategy for theorising, from within a theory of types of ideas, about the kind of mental content that appears in his theory of sensory perception as a result of the problem of dissimilarity (PD). In the *Comments*, the place that innateness occupies in the argument is what in other works (the *Treatise on Light* and the *Optics* prominently) was suggested by means of mental activity.

We have seen that Descartes was oddly nonchalant in his suggestion of hyper-nativism. This is because the major claim concerning mental activity had already been suggested, and the *Comments* only provide a corollary that Descartes perhaps never fully developed: that of expressing the elusive doctrine of mental activity with the help of the theory of innateness. According to this development, the claim concerning the contribution of the mind to the representational content of ideas could alternatively be expressed as the claim regarding the innateness of adventitious ideas. This is, in a nutshell, Cartesian hyper-nativism. I have provided grounds for this reading by identifying a change of rationale in Descartes' taxonomies of ideas. After presenting the different argument of the section, I have made a brief case for considering sensory ideas as 'adventitiously conditioned' rather than 'adventitiously elicited'. Although Descartes' claims about the ontological status of sensation are by no means easy to disentangle, they are at least able to shed some light on a causal story for brain-mind interaction in which the mind is active in a meaningful senses. This causal story, so I contend, can still also be properly called 'semantic'.

CHAPTER 4

MENTAL ACTIVITY

AND THE PERCEPTION OF SENSIBLE QUALITIES

0. INTRODUCTION

In the three previous chapters, I have presented three different aspects of Descartes' theory of sensory perception that lead separately, and to different degrees, to the conclusion that the mind is active in the sense of contributing to the representational content of ideas. In Chapter One, I offered an analysis of the terminological balance that Descartes carefully employs for describing the interaction of the brain and the mind. I argued that it points to a metaphysically interesting distinction between types of causes that strongly suggests the causal efficacy of the mind in sensory perception. In Chapter Two, I filled in the details of a causal model of sensory perception with a semantic approach in which the mind acts as a decoder. I concluded that Descartes' identification of brain states as natural signs constitutes his most fruitful attempt at explaining the workings of sensory perception. In Chapter Three, I explored Descartes' qualified hyper-nativism as a strategy for formulating the type of mental content that appears in a theory of sensory perception in which the mind is not a passive receiver of physical inputs.

It is important to note that, aside from supporting the mental activity thesis, these three aspects have something else in common in their way of approaching the topic of sensory

perception: they all focus on the perception of complete objects. This is, indeed, one of the ways in which Descartes himself addresses the issue of sensory perception. It is not, however, the only one. Descartes also persistently dealt with the sensory perception of the qualities that constitute those complete objects. It is not controversial to assert that, even though Descartes did not use the terms ‘primary’ and ‘secondary’ qualities, a similar difference between types of sensible qualities emerges from his texts. For example, we are told that certain sensible qualities of objects (such as size, shape, motion, etc.) are intrinsic properties of matter, whereas others (such as colours, smells, tastes, etc.) are products of the interaction of objects with a perceiver (that is, of the interaction between the extended and the thinking substance). This division, as we shall see throughout the chapter, was not unusual at the time. A version of it, tracing back to Aristotle, was commonplace amongst Scholastic thinkers, and it was progressively reshaped by the reforming aims of the natural philosophers of the seventeenth century with Galileo, Bacon, and Descartes in the lead.

Crucially for this project, the way in which Descartes draws a distinction between types of qualities poses an important challenge to an interpretation of a theory of sensory perception along the lines of the mental activity thesis. Descartes often characterises ideas of shape, size, or motion (that is, ideas of primary qualities) as ‘clear and distinct’, whereas ideas of colours or smells (that is, ideas of secondary qualities) are deemed as ‘obscure and confused’. While the former seem to be perceived intellectually, the latter are subjected to the confused grasp of the senses. One interpretation of Descartes’ theory holds that sensory perception is fragmented into clear and distinct intellectual perception of primary qualities *and* obscure and confused sensory perception of secondary qualities. This reading has been labelled as the ‘bifurcation reading’ by Simmons (2003), who has opposed it compellingly.

The bifurcation reading seems to be supported by the texts, and it leads to a division of single acts of perception of objects that is not particularly satisfactory from a philosophical perspective. Most importantly, however, it poses a problem for the assessment of the Problem of Dissimilarity (PD) that I have previously presented. The phenomenon of dissimilarity, so I have contented, is constitutive of sensory perception, and it is the motivation for introducing the activity of the mind into the process. However, when taking the standpoint of the perception of qualities (and not entire objects), Descartes seems to

maintain that ideas of primary qualities are not subjected to the phenomenon of dissimilarity, and therefore, do not require the contribution of the mind in such a way. This reading also finds further support in the fact that, when Descartes describes the (PD), he tends to focus almost exclusively on ideas of secondary qualities. If this is the case, the mental activity thesis could be simply considered as an *ad hoc* addition with the sole purpose of dealing with the puzzling nature of ideas of secondary qualities. It could not be considered, consequently, as an all-encompassing feature of a unified theory of sensory perception.

This chapter is designed to find a way out of this textual tension and show that the way in which Descartes establishes the distinction between sensible qualities does not impede an interpretation of his theory of sensory perception in which there is a significant role for the causal efficacy of the mind. The implication of this argumentation is also, ultimately, that the Cartesian theory of sensory perception does not have, in this respect, a fragmented nature. The chapter is structured in three sections. In §1, I outline the distinction between primary and secondary qualities in the Early Modern context. I start to characterise the Cartesian position on the status of sensible qualities as opposed to a standard Aristotelian-Scholastic doctrine that posits ‘real qualities’ (colour, heat, smell, and the like) as genuine properties present as such in physical objects. In §2, I present in detail the bifurcation reading, and I offer two arguments against it. The first clarifies the meaning of the ‘obscurity and confusion’ attributed to the grasp of the senses, and it concludes that, in fact, Descartes considered the (PD) a problem across the board (and not only for ideas of secondary qualities). The second establishes that, when Descartes ascribes ‘clarity and distinctness’ to the intellectual perception of primary qualities, he refers only to the properties of matter considered abstractly. Finally, in §3, I explore the rationale behind his distinction between types of qualities and I argue that the (PD) is not what distinguishes them. Overall, the activity of the mind is retained as a necessary feature for sensory perception in a model in which the (PD) remains as the architect of a unified account.

SECTION 1. THE EARLY MODERN DISTINCTION BETWEEN PRIMARY AND SECONDARY QUALITIES

The objects of sensory experience exhibit a variety of qualities to perceivers. When I perceive a nectarine, for example, I notice its round shape, its firm consistency, as well as the red and yellow tones of its waxy skin. A standard form of the Early Modern philosophical distinction between perceptible qualities would classify the traits of the nectarine into two groups. A quality such as shape would be considered fundamental or ‘primary’, and a quality such as colour would be considered derivative or ‘secondary’. The Early Modern natural philosopher would argue that this is because primary qualities exist in matter in a way that resembles our perceptions of them, and secondary qualities are presented in our perceptions in a way that is different from the way in which they exist in matter. Colour, for example, is now explained in terms of wavelengths of the electromagnetic field we experience as light, but the colour in our perception (what is called the phenomenal colour) is different from what is exhibited by the arrangements of matter in the physical world. Similarly, Descartes and other corpuscularians at the turn of the seventeenth century would say that colour is explained by the interaction of particles at the surface of objects with particles of light. Particles of objects impart spin to particles of light, and the variations in the resulting two types of particle motion is what we perceive as different colours (the rectilinear motion by which particles approach our eyes, and their spin *i.e.* the motion by which ‘they turn about their own centres’, DHB AT XI 225/CSM I 323)¹. This physical process is dissimilar from the content of our perception of colour while varying with it. In this respect, secondary qualities depend on primary ones at least in the minimal sense that they track consistently their variations. Scholastic and Early Modern philosophers would agree on this point about perceptible qualities, while clashing over what this dependence amounted to.

¹ For instance, Descartes writes about the difference between blue and red in this manner: ‘If the speed at which they (material particles) turn is much smaller than that of their rectilinear motion, the body from which they come appears *blue* to us; while if the turning speed is much greater than the rectilinear motion, the body appears *red* to us’ (DHB, AT XI 225/CSM I 323, my clarification).

A standard Aristotelian-Scholastic theory of matter featured a common-sense distinction between qualities that could be perceived by more than one sense ('common sensibles') and qualities that were exclusively perceived by one of the senses ('proper sensibles'). Size and shape would be examples of the former, and colour and smell instances of the latter.² Descartes rehearsed uncritically this distinction at least twice: first in the *Optics* ('regarding light and colour, the only qualities belonging properly to the sense of sight...' D6 AT VI 130/CSM I 167), and later in the *Principles* ('characteristics like colour, sound and the rest, each of which is perceived not by several senses but by one alone; for the images of them which we have in our thought are always confused, and we do not know what they really are', Pr IV 200, AT VIII 323-24/CSM I 286). This classification shares an intuition about types of qualities with the primary and secondary qualities distinction, and it also generates an approximately coextensive result (Simmons 2015:83). The common intuition refers to the fact that certain properties of objects exist in matter in a more fundamental way, whereas others exist insofar as there is a particularly suited sense to perceive them. Specific controversies aside, the members of the categories of primary and secondary qualities coincide with common and proper sensibles respectively. It is safe to say that Descartes inherited this common classification from his studies at La Flèche and that he used it merely as a tangential remark for complementing his account of vision. His corpuscular theory of matter (and in general the new mechanistic physical theory being developed at the time by Galileo, Isaac Beeckman³, and others) was set to eliminate accounts, like the Aristotelian-Scholastic one, that exhibited little explanatory power. A classification of qualities in terms of the senses that perceive them does not take us very far in the knowledge of matter, and it does not seem to live up to the Early Modern scientific task of carving the natural world at

² Aristotle writes in *On the Soul*: 'In dealing with each of the senses we shall have first to speak of the objects which are perceptible by each (...) one consists of what is perceptible by a single sense, the other of what is perceptible by any and all of the senses. I call by the name of special object of this or that sense that which cannot be perceived by any other sense than that one and in respect of which no error is possible; in this sense colour is the special object of sight, sound of hearing, flavour of taste (...) Common sensibles are movement, rest, number, figure, magnitude; these are not peculiar to any one sense, but are common to all' (II.6/418a20-418a25).

³ Descartes himself worked with Beeckman (1588-1637) from November 1618 to early 1619. Beeckman had been applying his micro-corpuscularianism to optics, hydrostatics, and acoustics, amongst other areas (Gaukroger 1995:72). He had a decisive influence in Descartes' scientific trajectory as a micro-corpuscularian.

its joints. The resulting lists of qualities might as well have had the same members respectively, but the way of arriving at the classification had to change.

The Early Modern distinction between types of perceptible qualities oftentimes took the form of an *a priori* conceptual analysis concerning the intrinsic properties of matter *i.e.* the properties a body cannot be conceived as not having (Simmons 2015:83, Pasnau 2011:508). Specifically, Descartes' understanding of physics as an experimental mathematical science is accompanied by the philosophical thesis that physics is ultimately grounded on metaphysical notions that are discovered innately.⁴ In Cartesian terms, the essence of body is discovered by the 'natural light' of the intellect. The ontology of Descartes' mechanism characterised these fundamental (or primary) qualities as 'modes' of extension, that is, as ways in which the attribute of extension is manifested, and by which we become acquainted with extended substance (Pr I 51, AT VII 24/CSM I 210). Those modes include 'size, (that is, extension in length, breadth and depth), shape, motion, position...' (Pr I 48, AT VIIIA 23/CSM I 208-9). Derivative (or secondary) qualities were then a result of interaction between the extended and the thinking substance. The passage from the *Principles* goes on to remark precisely this:

We also experience within ourselves certain other things which must not be referred either to the mind alone or to the body alone. These arise (...) from the close and intimate union of our mind with the body. This list includes (...) all the sensations, such as those of pain, pleasure, light, colours, sounds, smells, tastes, heat, hardness...⁵

⁴ At this point the Preface to the French edition of *Principles* comes inevitably to mind: 'Thus the whole of philosophy is like a tree. The roots are metaphysics, the trunk is physics, and the branches emerging from the trunk are all the other sciences...' (AT IXB 14/CSM I 186)

⁵ Before Descartes, Galileo (1564-1642) had offered a similar *a priori* argument in *The Assayer* (1623). Although his corpuscularianism was far from being a purely kinetic theory (in the sense of reducing all phenomena of the natural world to motions of micro-corpuscles), he can be considered the forerunner of the sharp distinction between primary and secondary qualities: 'Now I say that whenever I conceive any material or corporeal substance, I immediately feel the need to think of it as bounded, and as having this or that shape; as being large or small in relation to other things, and in some specific place at any given time; as being in motion or at rest; as touching or not touching some other body; and as being one in number, or few, or many. *From these conditions I cannot separate such a substance by any stretch of my imagination (...)* But that it must be white or red, bitter or sweet, noisy

One of the upshots of this *a priori* approach within the mechanistic scientific framework is that, insofar as they depend on interaction between matter and mind for their existence, secondary qualities do not have a place in scientific explanation (Nolan 2011:2). For the new scientist, and particularly for a dualist like Descartes, facts such as the sweet taste of a nectarine when it is ripe, or the yellow and red tones of its skin, cannot be included in a list of objective facts about the natural world because they do not mirror, expressed in this manner, the properties of matter, but instead the properties of *our* sensory perception of it.⁶ Certainly, that for the Early Modern natural philosopher the senses were considered a vital source of knowledge about the world is incontestable. One can take, as a plain example, Descartes' physiology and theory of light, which were the result of painstaking observations. At the same time, however, the new scientific framework of mechanism broadly construed (the reduction of all natural phenomena to motion of micro-particles, either corpuscles or atoms, depending on the specific mechanistic theory) opened a breach between appearance and reality that deemed the senses a misleading source requiring intellectual assistance for achieving truths about the world.

As we have seen before, Descartes' mechanism and the metaphysics of it need to be understood under the light of the rejection of the Scholastic-Aristotelian common-sense inspired scientific approach according to which the senses are a reliable source in getting us acquainted with truths about the natural world. More particularly, one needs to read Descartes' account of qualities as a rejection the 'substantial forms' and 'real qualities' of Scholastic natural philosophy. He considered them obscure, redundant, and explanatorily impotent as opposed to the quantitative reduction of mechanism, which exhibited the

or silent, and of sweet or foul odor, my mind does not feel compelled to bring in as necessary accompaniments' (1957: 274, my emphasis)

⁶ It is safe to say that this is one of the revolutionary ideas brought about by the seventeenth-century Scientific Revolution - an idea that has shaped scientific explanation to the present day. The thesis that the Scientific Revolution was primarily a revolution in scientific explanation has been explored, for instance, by Hatfield (1996). For the metaphysical grounding of Descartes' physics, see Garber (1992). For a common, contemporary approach to the metaphysics of secondary/derivative qualities and their exclusion from scientific explanation, Stroud (2002) offers a comprehensive account. The scientist, Stroud writes, does not need the word 'yellow' in order to appropriately describe a lemon, but she only needs to refer to wavelengths of light. Descartes would subscribe this explanation.

clarity and distinctness that belongs to mathematics. A particularly clear expression of this position appears in a letter to Regius:

Substantial forms (...) were introduced by philosophers solely to account for the proper actions of natural things, of which they were supposed to be the principles and bases (...) But no natural action at all can be explained by these substantial forms, since their defenders admit that they are occult and that they do not understand them themselves. If they say that some action proceeds from a substantial form, it is as if they said that it proceeds from something they do not understand; which explains nothing. So these forms are not to be introduced to explain the causes of natural actions. Essential forms explained in our fashion, on the other hand, give manifest and mathematical reasons for natural actions (January 1642, AT III 506/CSMK III 208-9).

Furthermore, the fable that Descartes presented in the *Treatise on Light* epitomises not only the *a priori* approach for determining the properties of matter, but also an anti-realist stance⁷ concerning secondary qualities based on the mathematisation of the natural world that had started with Galileo. The premise of the *Treatise on Light* is precisely that the scientist needs only to posit matter and motion in order to explain all natural phenomena. Descartes invites the reader to imagine a different world that *looks* identical to the actual world (a world with ‘real qualities’), but in which all natural phenomena should be, as far as possible, accounted for in the mechanistic terms that he presents in detail:

For a while, then, allow your thought to wander beyond this world to view another, wholly, new, world (...) Now since we are taking the liberty of imagining matter as we fancy, let us attribute to it, if we may, a nature in which there is absolutely nothing that everyone cannot know as perfectly as possible. To this end, let us explicitly assume that it does not have the form of earth, fire, or air (...) nor does it have the qualities of having any taste, odour, sound, colour, light... (AT XI 31,33/G 21-22)

The thought experiment results in the two worlds being indistinguishable from each other. As a consequence, and relying on the principle of parsimony, the mechanistic framework

⁷ The anti-realist claim will be qualified in the upcoming paragraphs.

emerges as a superior explanation in respect to the Aristotelian-Scholastic one ('Nature always acts by the simplest and easiest means', Descartes writes at the end of the *Treatise on Man*, AT X 201/G 168). This means that there is no need to postulate real qualities such as colour, smell, heat, cold, *etc.* as existing *as such* in objects, because the geometrically derived properties of matter are sufficient to capture everything that there is to say, scientifically, about sensory qualities.⁸ Amongst other prominent commentators, Garber has expressed this point accurately:

The bodies that exist in the world are extended things and extended things alone, the objects of geometry made real; while they can be said to have broadly geometrical properties (...) they lack all of the sensory qualities like heat, cold, taste... (1992:63).

It is important to note that the fact that Descartes was an anti-realist about secondary qualities does not amount to the claim that secondary qualities are non-existent or illusory. In order to understand the status of secondary qualities in Descartes (and in other rationalists such as Malebranche and Leibniz), one needs to read claims about the unreality of colours, sounds, and the like, as a rejection of the *realitas* attributed to the qualities of the Scholastics. It has been correctly pointed out by a few commentators that, when Descartes claims that the natural world lacks 'real qualities', or when he denies the 'reality of sensible qualities' he is making a point about their ontological status (that is, their degree of reality) instead of claiming that they don't exist at all (Menn 1995, Clarke 2003, Hatfield 2005). 'Reality' and 'real' refer, in those assertions, to a technical Scholastic term: the *realitas* of

⁸ For example, after Mersenne had asked him about some specifics about his theory of matter, Descartes responds that his rejection of real qualities is due to two reasons: that they are (a) unintelligible and (b) unnecessary given the superiority of mechanistic explanations. 'My principal reason for rejecting these real qualities is that I do not see that the human mind has any notion, or particular idea, to conceive them by; so that when we talk about them and assert their existence, we are asserting something we do not conceive and do not ourselves understand. The second reason is that the philosophers posited these real qualities only because they did not think they could otherwise explain all the phenomena of nature; but I find on the contrary that these phenomena are much better explained without them' (To Mersenne, 26th April 1643, AT III 649/CSMK 216. For a similar assertion, see Pr IV 198, AT VIIIA 322-3/CSM I 285).

something refers to its status as a *res* (Latin for ‘thing’).⁹ According to some of the Scholastics (Francisco Suárez included, who was amongst Descartes’ main sources for metaphysical terminology), for something to have the status of a *res*, that something could exist independently from the entity of which it was predicated (Clarke 2003:30). Thus in the Aristotelian-Scholastic theory (and following Aristotelian terminology) the yellow colour of the nectarine’s skin is a quality that exists in the object as a *real accident* of the *category* of *quality* that characterises non-essentially the *form* of nectarine. It is counted, in other words, as an additional component that is not reducible to the arrangements of matter that make up the nectarine. It is in this sense that is counted as a real quality: it is ‘as much of a thing’ as the size, shape, or any other property of the nectarine.¹⁰

This translates into a theory of sensory perception in which, as we have seen before, an actual sample of a given property in objects (a form without matter, or ‘intentional species’) reaches the observer and informs their sensory organs. Sensory perception comes about when ‘the sensitive faculty of the soul becomes like the object perceived’ (Simmons 1994:257). This account has at its core a teleological stance. Namely, that we are equipped with the sense organs that we do have because they are teleologically ordained to display the world as it is. In this account, a theory of perception is shaped around a similarity thesis between objects and ideas, and this is why entities such as real accidents, for instance, were

⁹ He writes in the *Treatise on Light*: ‘those that the Schoolmen call (...) *qualitas reales* (their real qualities), in which I frankly confess I cannot find any more reality than in the others’ (AT XI 40/G 27). One can also find this technical term in Descartes’ usage of the notions of formal and objective reality in the *Meditations*. They are an obvious case of the use of ‘reality’ as meaning ontological status.

¹⁰ For the purposes of this dissertation, I can only present here a cursory treatment of the Aristotelian-Scholastic theory of qualities and its differences with Early Modern theories. I add here a brief qualification about them. As stated above, there is an area of agreement between Scholastic and Early Modern accounts of types of perceptible qualities. Namely, that some qualities are derivative or secondary in the sense that they depend for their occurrence on fundamental or primary ones. This has been called the ‘supervenience thesis’ concerning perceptible qualities (Pasnau 2011:465) insofar as it accommodates reductionist and non-reductionist explanations under the claim that there is no change in secondary qualities without a change in primary qualities. In the Aristotelian-Scholastic tradition, the supervenience thesis features ‘prime matter’ (as the substratum of all changes), shaped by primary qualities (hot, cold, wet, and dry) that give rise to the four elements (earth, air, fire, and water), which are the ‘building blocks of the natural world’ (Pasnau 2011:462).

needed in explanation.¹¹ This standpoint was to be progressively banished by the new scientific models of the seventeenth century on the basis of experimentation, and assisted by philosophical claims about its incorrect direction of fit (that is, claims about the perceiver making the world a certain way).¹² In this last respect, Descartes and others can be read as also charging the standard Aristotelian-Scholastic theory with anthropomorphising nature by confining the natural world to pre-made notions derived from the human mind (Ott 2009:41).

For Descartes, on the contrary, nothing is added to the ontology of the natural world over and above the arrangements of particles of matter. What we refer to as the colour, smell, or taste of a piece of fruit are not real accidents, but modes of extension (*Sixth Replies*, AT VII 434/CSM II 293). It is in this sense that these qualities are not ‘real’ in Descartes’ picture of the natural world.¹³ Descartes’ iconic example of the blind man that perceives the properties of an object with a stick is set to demonstrate precisely this: ‘the differences a blind man notes between trees, rocks, water and similar things by means of his stick do not seem any less to him than the differences between red, yellow, green and all the other colours seem to us. And yet in all those bodies the differences are nothing other than the various ways of moving the stick or of resisting its movements’ (Op, AT VI 85/CSM I 153).

¹¹ Although this is not everything that there is to say about the Aristotelian-Scholastic theory, it is nonetheless something that Descartes considered crucial to it: ‘But the principal argument which induced philosophers to posit real accidents was that they thought that sense-perception could not be explained without them’ (Sixth Set of Replies, AT VII 435/CSM II 293)

¹² As Gaukroger (1995:283) points out, paradigmatic cases for explaining why the Aristotelian teleological model based on a similarity thesis started falling apart at the beginning of the seventeenth century came from developments in the field of optics. In the influential *Ad Vitellionem Paralipomena* (1604), Kepler demonstrated, for instance, that the optical image is formed in the retina and not in the crystalline humour, and that the image is inverted. The driving force in experimentation was getting right the physical and physiological parts of the story, with considerations about the function of perception depending on those instead of the other way around.

¹³ Pasnau (2011) offers a helpful characterisation of this change in the ontology of qualities during the Early Modern period. Certain properties ceased to be considered as ‘things’ in objects, and they start to be regarded as ‘events’. This transition (both in ontology and in physics) is clear, for instance, in the new kinetic theory of heat developed by Bacon, Galileo, and Descartes.

This results into a theory of perception that will attempt to incorporate and explain the gap between appearance and reality, as much as possible, in a mechanistic way. It is particularly clear from the treatment of heat in the *Treatise on Light* (AT X 7-10/G 6-8), of colour in the *Meteorology* (D8, AT VI 325-337/G 85-92), and of heaviness¹⁴ in the *Treatise on Light* (AT X 11-16/G 9-12) and the *Sixth Set of Replies* (AT VII 441-2/CSM II 297-8) that Descartes is not denying that these qualities are actual properties of things, but rather that their nature (what ultimately constitutes them) cannot be deciphered from our sensory experience of them (Hatfield 2005:43). The natural world is made up of objects that are extended but not hot, heavy, scented, or coloured in the way in which those qualities appear as a result of the object affecting a specific perceptual apparatus (Nolan 2011:3). In other words, to say that the flesh of a nectarine is yellow amounts to saying that it consistently appears yellow to perceivers under normal conditions. We have already seen that, in the Cartesian theory, this process is described as a law-like interaction between brain and mind, and that it is only when restricting the focus to the mental domain that it is adequate to talk about qualities (as opposed to quantities), since it is beyond the scope of mechanistic explanations.¹⁵

This illuminates a further point about the distinction between primary and secondary qualities. What we have come to designate secondary qualities are, in fact, perfectly proper components of the world in the sense that there is nothing inherently substandard about them (Simmons 2015, Smith 1990). It is our sensory experience of them that introduces an ambiguity. It is upon reflection of our perceptions in relation to the mechanistic picture of the world that we arrive at a distinction between primary and secondary status.¹⁶ Descartes' position on this issue can be spelled out by means of three main considerations:

¹⁴ It is sometimes translated as 'gravity', from the original Latin 'gravitas' (AT VII 439/CSM II 296)

¹⁵ To be precise, three phenomena are for Descartes beyond the scope of his mechanistic explanations: consciousness, sensory perception, and meaningful use of language.

¹⁶ Simmons puts it concisely: 'That there is an ontological difference between a kumquat's shape and its colour does not suggest itself to perceptual experience: both look to be out there in the kumquat. Arguments for distinguishing their ontologies therefore did not typically rely on introspecting perceptual experience. They piggybacked on arguments for the mechanical hypothesis itself (2015:83)

- (1) First, all that there is in the natural world is motion of differently-sized particles, but from this state of things, and given the presence of a perceiver (that is, a mind), it is correct to identify certain properties as having a different status because they are mind-dependent. They do not belong, as such, to the physical and ontological descriptions of the natural world, but they do have a place in the true ontology of reality insofar as they belong to the thinking substance as united to the body (*i.e.* the human being). It is only in this sense that Descartes can be considered a realist about secondary qualities.
- (2) Second, the Cartesian mechanistic model is, therefore, not equivalent to claiming that the content of our ideas of secondary qualities is illusory or superfluous, because it is the natural by-product of the mind-body union. Despite the elusive problem of dissimilarity between ideas of secondary qualities and their physical causes, they are subject to the functional argument for survival that brings in an all-powerful, benevolent God. Descartes made frequently the point that, despite dissimilarity, it is evident that our perceptions are fitted for tracking consistently the states of the world, and in this sense they are 'sufficiently clear and distinct' (AT VII 83/CSM II 57).
- (3) Third, even though ideas of secondary qualities co-vary successfully with their causes, and even though Descartes offers an argument (even if faulty) for their functionality, there is a sense in which, for him, they are potentially problematic. Since a difference in the ontological status of qualities is not the type of information that is available by introspection into our sensory perceptions, ideas of secondary qualities make perceivers prone (but not irremediably subject) to a common mistake of judgment made 'from childhood onwards without any rational basis' (AT VII 83/CSM II 57). This refers to the judgment that 'all the objects of our sense-perception are things existing outside our minds and closely resembling our sensations, *i.e.* the perceptions that we had of them.' (Pr I 66, AT VIIIA 32/CSM I

216).¹⁷ Descartes made this point frequently, and he offered plenty of examples for illustrating it. In the crucial first chapter of the *Treatise on Light* (AT X 6/G 5), he presents, amongst others, the case of dissimilarity between the touch of a feather and the tickling sensation that it produces (an example that had already been used by Galileo almost ten years before).¹⁸

Finally, these points also shed light on Descartes' mindful use of language when addressing ideas of secondary qualities. He often precedes them with a cautious remark about language use: 'what *we are calling* colour' (Pr I 70, AT VIII A 34/CSM I 218 my emphasis), '<*We call these qualities* hardness, heaviness, heat, *etc.*>' (Pr IV 191, AT VIII A 318/CSM I 282 my emphasis)¹⁹, 'the light in bodies *we call* luminous' (AT VI 84/CSM I 153 my emphasis), 'the properties in external objects to which *we apply the terms* light, colour, smell... ' (Pr IV 198, AT VIII A 322/CSM I 285). These remarks are supposed to capture the dissimilarity between ideas and their physical causes, while making a general point about ordinary language also supported by the claims above.²⁰ Namely, there is no inadequacy in addressing certain motions of particles as 'colours', 'smells', *etc.* if one accepts, at the same time, the dissimilarity thesis ('when we say that we perceive colours in objects, this is really just the

¹⁷ I think that Menn (1995:199) is right in connecting this issue with the notion of 'material falsity'. It is not always clear what Descartes means when he says that sensory ideas can be materially false in the *Meditations*. Menn suggests that the clue is found in the Fourth Set of Replies, where Descartes writes that 'some ideas are materially false' in that 'they provide the judgment with material for error' (AT VII 231/CSM II 161). The 'material' that they provide is an idea that does not resemble its physical causes. They present colour, heat, odour, *etc.* as if they were, as such, things in the natural world. This seems to be what Descartes has in mind when he writes that some ideas 'represent non-things as things' ('non rem tanquam rem', MM AT VII 43/CSM II 30).

¹⁸ Galileo offers in *The Assayer* a similar thesis: 'a feather drawn lightly over any part of our bodies performs intrinsically the same operations of moving and touching, but by touching the eye, the nose, or the upper lip it excites in us an almost intolerable titillation, even though elsewhere it is scarcely felt. This titillation belongs entirely to us and not to the feather' (1957:275).

¹⁹ Following the practice of the CSM, angle brackets indicate differences and additions to the original texts in translations that were authorised by Descartes. In this case, this is an addition in the French translation of the *Meditations* produced in 1647 by Louis-Charles d'Albert, Duc de Luynes.

²⁰ This point is succinctly made in the *Principles*: 'The fourth cause of error is that we attach our concepts to words which do not precisely correspond to real things' (Pr I 74, AT VIII A 37/CSM I 220)

same as saying that we perceive something in objects whose nature we do not know' Pr I 70, AT VIII A 34-5/CSM I 218).²¹

In this section, I have presented an overview of the distinction between perceptible qualities in the Early Modern period, and I have started to characterise the Cartesian theory. In what follows, I tackle the implications of the distinction for Descartes' theory of sensory perception. I concentrate on the issue of whether it is possible to integrate a distinction of perceptible qualities with the thesis that the mind is (or rather, needs to be) active in sensory perception due to an all-encompassing Problem of Dissimilarity (PD) between mechanistic explanations and mental representations.

SECTION 2. SENSIBLE QUALITIES AND THE BIFURCATION READING

So far we have looked at an overarching characterisation of the Early Modern distinction between perceptible qualities. Even though Descartes does not allude to the types of perceptible qualities with a clear division of terms, his way of treating the issue seems to reveal a genuine difference in kind between them. At this point, a main question arises: what is the implication of this division for a unified theory of sensory perception, especially one in which the mind is active in the sense of contributing to the representational content of ideas? The integration, in a unified theory of sensory perception, of a genuine distinction between qualities with the thesis of the activity of the mind in sensory perception has to outlive two related textual threats:

²¹ That Descartes was set to clarify this systematic ambiguity in the use of the terms for secondary qualities has been pointed out by Pasnau (2011) and Nolan (2011). Pasnau shows, importantly, that an eminent Cartesian like Malebranche merited Descartes with having clarified the discussion precisely in that respect: 'Only since Descartes do we respond to these confused and indeterminate questions -whether fire is hot, grass green, sugar sweet, and so on- by distinguishing the equivocation of the sensible terms that express them' (*Search After Truth* VI.2.2)

- (1) First, Descartes' almost exclusive emphasis on ideas of colour, taste, sounds, and the like precisely when presenting the (PD) could give the impression that, if there is a problem to account for in a description of the cognitive structure of sensory perception, this problem *only* affects ideas of secondary qualities. This would lead to the conclusion that there is a fundamental difference between the perception of different qualities and that, presumably, the activity of the mind is only invoked (perhaps in a rather *ad hoc* manner) to account for the mysterious nature of ideas of secondary qualities. It would seem, therefore, that a unified theory of perception in which the mind is active due to the (PD) is not a plausible interpretation given this division.
- (2) Second, this defeatist reading would also be supported by Descartes' insistence on the 'clarity and distinctness' of our perception of primary qualities (the geometrically derived properties of bodies) while deeming our ideas of secondary qualities as 'obscure and confused'. It would appear that, for the former, the activity of the mind would then not be necessary. The view that Descartes' theory splits perceptual cognition between the (clear and distinct) intellectual perception of primary qualities and the (obscure and confused) perception of secondary qualities has been labelled as 'bifurcation reading' by Simmons (2003). She has identified it as an erroneous, rather habitual trend in the Cartesian scholarship. I will follow her designation throughout the section.²²

In this section I will contend that the Cartesian distinction between types of perceptible qualities does not obstruct the mental activity thesis and, consequently, it is possible to reconstruct a unified theory of sensory perception. I arrive at this conclusion by ruling out

²² For the line of thought that I will present in this section, I am indebted to Simmons' compelling case against the bifurcation reading (2003). Her position is my starting point, although I eventually differ from it in the argumentation. If I have read Simmons correctly, her rejection of the bifurcation reading aims ultimately at the claim that Descartes' account of the cognitive structure of sensory perception is shaped by the collaborative activity of the senses and the intellect for both ideas of primary and secondary qualities. A crucial component of her view—the nature of constructive judgments—comes from an analysis of the distinction between three grades of sensory perception that Descartes advances in the Sixth Set of Replies (AT VII 436-9/CSM II 294-5).

the bifurcation reading. That is to say, I argue that it is a mistake to attribute to Descartes the view that certain *particular* qualities are perceived more clearly than others and that the (PD), as presented in Chapters 1 and 2, does not square with a distinction between primary and secondary qualities. The upshot of this argumentation is that dissimilarity between ideas and their physical causes remains a challenge across the board (that is, for both types of qualities), and the activity of the mind remains, likewise, a plausible Cartesian answer. In the following paragraphs, I lay out these textual tensions in more detail and, after that, I start the argumentation against the bifurcation reading (in §2.1 and §2.2).

Certainly, it cannot be denied that, throughout his works, Descartes draws a distinction between the perception of primary and secondary qualities (although he does not use these terms). His way of creating lists of qualities reveals a contrast, but it is not immediately clear what is the criterion behind the classification. Again, one possible answer is that the criterion is the way in which a quality is perceived. Primary qualities are perceived with clarity and distinctness, and secondary qualities are perceived with obscurity and confusion. This is supported by the fact that, in Descartes' texts, the general rationalist thesis that sensory perception is a dubious source of knowledge coexists with his claims about our ability to apprehend certain properties of bodies with clarity and distinctness.

This criterion fits well with a standard version of the Early Modern distinction between primary and secondary qualities based on a relation of similarity/dissimilarity between ideas and their physical causes. It fits well because Descartes' use of the terms 'clarity and distinctness' and their counterparts 'obscurity and confusion' attached to primary and secondary qualities respectively, admits of a natural reading in terms of similarity and dissimilarity. That is, an idea of a primary quality is clear and distinct because it gives accurate information about its physical cause, and this is *because* it is similar to it. An idea of a secondary quality is obscure and confused because it does not provide accurate information about its physical cause, and this is *because* it is completely dissimilar to it. The bifurcation reading seems to be supported by theses laid down in two of Descartes' philosophical pinnacles: the *Meditations* and the *Principles*. There, he often opposes the clear and distinct perception of size, shape, motion, and position to the obscure and confused perception of colour, light, sounds, smells, *etc.*, which are qualities that 'must be referred to

the senses'. The following passages are frequently used in support of the bifurcation reading. They are from Meditation Three and Part I of the *Principles* respectively:

As to my ideas of corporeal things, (...) I notice that the things which I perceive clearly and distinctly in them are very few in number. The list comprises size, or extension in length, breadth and depth; shape, which is a function of the boundaries of this extension; position, which is a relation between various items possessing shape; and motion, or change in position (...) But as for all the rest, including light and colours, sounds, smells, tastes, heat and cold and the other tactile qualities, I think of these only in a very confused and obscure way... (AT VII 43/CSM II 29-30)

This will be specially clear if we consider the wide gap between our knowledge of those features of bodies which we clearly perceive (...) and our knowledge of those features which must be referred to the senses (...) To the former class belong the size of the bodies we see, their shape, motion, position, duration, number and so on (...) To the latter class belong the colour in a body, as well as pain, smell, taste and so on. (Pr I 69 AT VIIIA 33-4/CSM I 217)

The title of principle I 69 —'We know size, shape and so forth in quite a different way from the way in which we know colours, pains, and the like'— could not be more clear, so it seems, about a bifurcation in the perception of sensible qualities and, in turn, about the superior epistemic status of our ideas of primary qualities. On the one hand, the association of primary qualities with clarity and distinctness suggests that the intellect is involved in the perception of such qualities. This divided picture is completed, on the other hand, by claims about secondary qualities belonging (or being 'referred to') the senses and to the 'mind-body union'. This seems to constitute a hybrid account of the perception of sensible qualities that is not particularly gracious from a philosophical perspective —perhaps not from a physiological perspective either, since it divides the cognitive structure of particular acts of perception. Given that external objects exhibit a variety of characteristics to perceivers, what does it mean that we get acquainted with some of them clearly and distinctly and by means of the intellect, and with others obscurely and confusedly and by means of the senses, that is, due to the mind-body union? This section is designed to disentangle this interpretative issue.

I believe that the bifurcation reading is incorrect. The fragmented character of the theory is merely additional support for an alternative interpretation (since it is possible, as a matter of fact, that Descartes would have offered a fragmented, philosophically untidy account). The main reason for rejecting the bifurcation reading comes from a distinction between the scope of sensory perception and the scope of the pure intellect that has ample support by textual evidence. In short, the distinction will show that a clear and distinct *intellectual perception* is possible for *both* primary and secondary qualities, and that, similarly, an obscure and confused *sensory perception* is the case for *both* primary and secondary qualities. So the bifurcation reading expresses an adequate intuition (that perception of qualities can occur in different ways), but it draws the division in the wrong place. I agree with Simmons in that the actual division is between sensory and purely intellectual perception (2003:551).²³

This means that there is still a fragmentation in the theory but, importantly, this fragmentation does not pose the problem of dividing single acts of perception. It is, rather, a description of the types of information that we can acquire from the world, and of the ways in which we can manage it. In the first section (§2.1) I show that, when Descartes describes sensory perception as obscure and confused, he has in mind both primary and secondary qualities. In the second section (§2.2) I revisit an argument that was first laid out by Wilson (1991,1993) and that, I believe, has not been sufficiently emphasised in assessments of Descartes' theory of perception. The argument is for the claim that, when Descartes writes about the clear and distinct perception of primary qualities, he refers to the properties of matter *in general* as opposed to the properties of a specific object perceived in a specific act of sensory perception.

²³ I share with Simmons the above motivation for dismissing the bifurcation reading, but I will take a slightly different route in the argumentation.

2.1. PERCEPTUAL ERROR AND THE 'TRUE NATURE OF BODIES'

Let us start with the first part of the argumentation. The first textual fact to acknowledge is that Descartes contemplates perceptual error regarding the macroscopic features of objects for both primary and secondary qualities. He provides some examples of perceptual error concerning primary qualities in Meditation Six, in the context of describing how sensory perception *as such* can make us fall into an error of judgment: 'that stars and towers and other distant bodies have the same size and shape which they present to my senses' (AT VII 82/CSM II 57). He makes the point again in the Sixth Set of Replies, this time with the example of the apparent shape of a stick that is submerged in water: 'when people say that a stick in water "appears bent because of refraction", this is the same as saying that it appears to us in a way which would lead a child to judge that it was bent' (AT VII 438/CSM I 296). In these cases, the information about primary qualities (size and shape) provided strictly by the senses culminates in ideas of minuscule stars, a square tower, and a bent stick. These ideas of primary qualities misrepresent the macroscopic features of those objects.

Nonetheless, the characterisation of sensory perception as obscure and confused includes, but is not exhausted by, the consideration of perceptual circumstances such as these, *i.e.* circumstances that we can classify as perceptual errors. Descartes intended obscurity and confusion as describing a more fundamental complexity of sensory perception considered across the board. Namely, (at least within a mechanistic, micro-corpuscular model) sensory perception fails to inform us about the 'true nature of bodies' (Pr I 73, II 5)²⁴. When perceiving primary qualities, we are not mistaken in identifying in our ideas of them properties that are contained within the definition of matter, such as size and shape. But in the Cartesian picture of the natural world, matter is homogeneous and its essence is

²⁴ A similar remark about the senses is found in Meditation Six: 'But I misuse them by treating them as reliable touchstones for immediate judgements about the essential nature of the bodies located outside us; yet this is an area where they provide only very obscure information' (AT VII 83/CSM II 57-8).

extension, and differences between bodies arise from the specific arrangements and motions of their microscopic parts. Importantly, we do not get acquainted with these specific arrangements and motions by means of the senses. Descartes restated this point frequently in his treatments of sensory perception, making therefore a case for considering it as one of his chief concerns with the theory beyond cases of error and illusion in the the perception of macroscopic features of objects.

Cases of perceptual error could add to the obscurity and confusion that belongs to sensory perception, but they don't suffice for making a case about sensory perception being *like that*. Rather, they seem to highlight the inconsistent reliability of the senses as an epistemic source. The senses 'sometimes deceive us', Descartes writes in the *Meditations* and in the *Discourse*, and that is why, according to his hyperbolic doubt, we cannot take them on board in the quest for indubitable truths that culminates with the discovery of the *cogito* (DM, AT VI 31-2/CSM I 126-7). In the presence of a more fundamental, inherent complexity in the very way in which the senses get us acquainted with the world, the fact that the senses deceive us sometimes about the macroscopic features of objects does not operate as a particularly consequential point within Descartes' taxonomy of the mental and his treatment of body-to-mind interaction.²⁵ While the senses deceive us *sometimes* about round towers and gigantic stars, they *inherently* present the natural world in a way that does not inform us about the ultimate causes of our perceptions, that is, the true nature of bodies, except 'occasionally and accidentally' (Pr II 3 AT VIIIA 41/CSM I 224).

Consider the following example concerning primary qualities that illustrates Descartes' point in contemporary terms. We experience the hardness of a block of ice (solid water) as very different from the consistency of liquid water. But by relying on the senses (whether touch or sight, for example), one can only *obscurely* and *confusedly* perceive the ways in

²⁵ Again, it has weight, however, as a phenomenon that casts doubt on the reliability of the senses and therefore rules them out as a source of indubitable knowledge in the first stage of the method of doubt: 'I thought it necessary to do the very opposite and reject as if absolutely false everything in which I could imagine the least doubt, in order to see if I was left believing anything that was entirely dubitable. Thus, because the senses sometimes deceive us, I decided to suppose that nothing was such as they led us to imagine' (DM, AT VI 31-2/CSM I 126-7).

which matter is arranged so to compose a solid or a liquid body. At the level of what Descartes would call the ‘true nature of body’, the hardness that the block of ice has to touch is the result of the fact that the orientation of the hydrogen bonds causes molecules to be pushed farther apart, thus lowering its density (the amount of matter contained). Given that Descartes contended that the world is a *plenum*, he could say that a solid body contains more *subtle matter* filling the gaps between molecules than a liquid one. Under ideal perceptual circumstances, one would not only form a sensory idea that does not represent clearly and distinctly the arrangement of primary qualities in the block of ice, but the perception could also prompt the false judgment that Descartes kept warning us about (that is, that the world resembles our sensory perceptions of it). This threat is emphasised for the case of secondary qualities, but it is not exclusive to them.

Crucially, the fact that sensory perception does not provide us with information about the nature of objects puts the perception of primary and secondary qualities on a par. There is ‘nothing’, Descartes writes categorically in the *Principles*, ‘whose *true nature* we perceive by the senses alone’ (Pr I 73 AT VIII A 37/CSM I 220 emphasis added).²⁶ Following one of his examples concerning a secondary quality, it is certainly puzzling that we hear a sound as a result of vibrating particles forming longitudinal waves: ‘if the sense of hearing transmitted to our thought the true image of its object, then instead of making us think of the sound, it would have to make us think about the motion of the parts of the air that are vibrating against our ears’ (TL AT X 5/G5). But it is no less puzzling than the inescapable fact that we experience a three-dimensional world upon receiving motion patterns that create a correspondent two-dimensional pattern at the internal cavities of the brain.²⁷

²⁶ This can be seen as connected to another of his well known anti-empiricist remarks: ‘only those who really concentrate and meditate and withdraw their minds from corporeal things, so far as is possible, will achieve perfect knowledge of them’ (Second Set of Replies, AT VII 157/CSM II 111).

²⁷ A similar point has been made by Hatfield (2005). Besides, as we have seen in previous chapters, Descartes includes in the process of sensory perception *as a whole* a brain state in the form of a structural (or isomorphic) representation. This physiological model based on motion correspondences included, therefore, a fundamental dissimilarity between objects and their corporeal representations. This dissimilarity was meticulously examined by the optical accounts at the time, starting with Kepler’s discovery of the function of the ‘crystalline humour’ in the eye (to refract the rays of light in such a way as to cause them to reassemble at a single point on the retina and

It is now a good time for bringing into the argumentation the problem that worried Descartes in the context of sensory perception, that is, the Problem of Dissimilarity. What these considerations and examples show, I believe, is that Descartes identifies the (PD) as a complexity of sensory perception across the board. He did not single out the problem as a puzzling feature that belongs exclusively to the perception of colours, tastes, smells, and other secondary qualities. This gives support to the interpretation that the (PD) is Descartes' chief concern in the treatment of sensory perception as a whole and that, by the same token, introducing mental activity across the board is Descartes' intended solution to it. I will come back to this towards the end of the chapter.

In conclusion, in this brief section about perceptual error, I have pointed out that Descartes considers sensory perception as obscure and confused across the board (for both types of qualities) because it fails to inform us about the true nature of body. This is true of the perception of primary and secondary qualities, and it is, simply, what sensory perception *is like*. This constitutes the first step in ruling out the bifurcation reading and in advancing, therefore, a unified account of Descartes' theory of sensory perception.

Nevertheless, a pressing question remains at this point. Charitably, one main reason for defending the bifurcation reading comes from passages in which Descartes connects the clarity and distinctness that belongs to the intellect to the perception of primary qualities, but not secondary qualities. The commitment to a mechanistic physiology makes clear that there is no bifurcation in different ways of perceiving qualities. However, this aspect of the theory seems to coexist in Descartes' texts with claims suggesting that primary qualities are perceived, at least partially and as opposed to secondary qualities, by means of the intellect. We have seen instances in the passages quoted above in which Descartes also attaches the adjectives 'clarity and distinctness' to the perception of those qualities. I deal with this question in what follows.

producing a two-dimensional, inverted image of the object). I am indebted to Simmons (2015:85) for understanding the details of Kepler's thesis in the *Ad Vitellionem Paralipomena* (1604).

2.2. THE PROPERTIES OF MATTER ‘GENERALITER SPECTATA’

The aim of this section is to conclusively rule out the bifurcation reading as a way of understanding Descartes’ theory of the cognitive structure of sensory perception. As outlined above, this involves dealing with the following tension: Descartes considered sensory perception of *all* qualities as subjected to the fundamental dissimilarity expressed by the (PD), and that results in an account in which sensory perception is defined as obscure and confused across the board. If this is the case, how does one square it with passages that suggest that the intellect is responsible for a clear and distinct perception of primary qualities in objects?

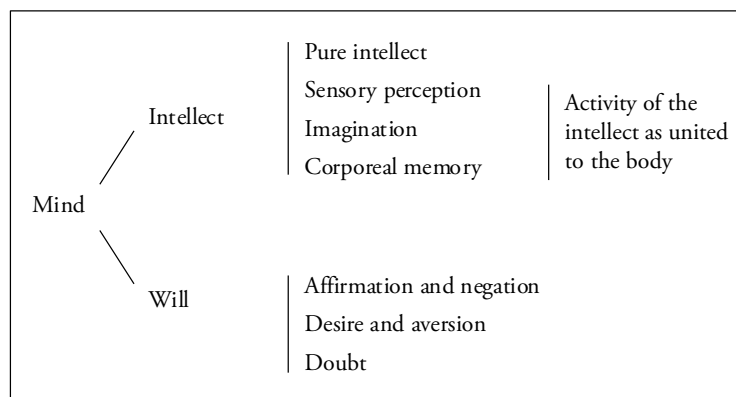
Before going any further, I outline some aspects of Descartes’ taxonomy of the mental as a preliminary remark (Fig.4 below)²⁸. This will help in making the interpretation clearer. According to Descartes, the mind has only two faculties or modes, that is, two main ways in which thought is manifested. These are the intellect and the will. The function of the intellect is to ‘perceive ideas’, in the sense of presenting and being aware of diverse mental contents. The will has the function of acting upon those contents, for instance by affirming or denying their truth.²⁹ In turn, these two faculties or modes have further particular modes, which indicate the different cognitive faculties. The intellect provides four modes: pure intellect, sensory perception, imagination, and corporeal memory. The will has further modes such as affirmation, negation, and others (Pr I 32, AT VIIIA 17/CSM I 204). There is an important point to be made about the modes of the intellect. The peculiarity of the

²⁸ Figure 4, and the corresponding explanation of Descartes’ taxonomy of the mental, have appeared in Chapter Three also for clarificatory purposes. I reproduce the figure once more to provide a succinct explanation of Descartes’ view that puts the following arguments in context.

²⁹ Meditation Four contains a clear exposition of the two faculties, in the context of determining the source of error: ‘All that the intellect does is to enable me to perceive the ideas which are subjects for possible judgments; and when consider strictly in this light, it turns out to contain no error in the proper sense of that term (...) the will simply consists in our ability to do or not do something (that is, to affirm or deny, to pursue or avoid); or rather it consists simply in the fact that when the intellect puts something forward for affirmation or denial or for pursuit or avoidance, our inclinations are such that we do not feel we are determined by any external force’ (AT VII 56-57/CSM II 39-40, see also Pr I 32, 34 for a similar account).

pure intellect is that its activity is entirely independent from the body (technically, its individual perceptions do not have corresponding brain states). The pure intellect is the faculty fitted for the perception of metaphysical truths, and its ‘clear and distinct’ perception, therefore, becomes in Descartes the ‘mark of truth’ (Hatfield 2016). However, not all intellectual activity is of this kind. Note that Descartes adds three more modes of intellect that require the body and, in that respect, are what he calls ‘special modes of thinking’ (MM AT VII 78/CSM II 54). While pure intellectual perception is a type of perception shared with disembodied minds (angels and God, in the Cartesian picture), sensory perception, imagination, and corporeal memory are ‘special’ because they belong to the mind *as* united to the body (they are bodily induced acts of intellect). In other words, they belong exclusively to the metaphysical entity that is the human being. As such, they tend to present ‘obscure and confused’ content that is, nevertheless, necessary for survival (MM AT VII 82-4/CSM II 57-8).

Figure 4. *Descartes’ taxonomy of the mental*



After this brief overview of Descartes’ taxonomy of the mind, we can move onto the argument of the section. The overview will assist in answering the question presented above: is it possible to reconcile Descartes’ appeal to the (PD) across the board with his claims about the intellectual, clear and distinct, perception of primary qualities? Is there a significant way in which the perception of primary qualities can be said to be *more* intellectual than the perception of secondary qualities? I defend that it is possible to reconcile the tension and that, in all significant senses, the perception of primary qualities remains on a par with the perception of secondary qualities.

The starting point of my defence is found in an argument by Wilson (1993, 1991) whose consequences, I believe, have not been emphasised enough in analyses of Descartes' theory of sensory perception —particularly in defences of a unified theory. In short, the argument states that when Descartes speaks about the clarity and distinctness with which the intellect perceives primary qualities in objects, he is concerned with the properties of matter considered 'abstractly' or 'in general', and not with the particular properties of an object in a particular act of perception. This also entails that, in terms of the faculties involved, claims about primary qualities being intellectually perceived are therefore concerned with the activity of the pure intellect rather than with the act of intellect that Descartes calls sensory perception. I will use Wilson's argument as the first step for showing that (as mentioned above) the division that Descartes draws in his picture of human perception is between purely intellectual perception of both primary and secondary qualities *and* sensory perception of both primary and secondary qualities.

Let us start with the argumentation. In 'Descartes on the Perception of Primary Qualities' (1991), Wilson maintains that Descartes' view on the perception of primary qualities differs from Locke's (who is often credited with the most qualified view on the subject during the Early Modern period) in one important respect. Whereas Locke held that particular sensory ideas of primary qualities resemble the 'concretely realized qualities of particular objects that are sensed' (Wilson 1991:27), Descartes stated that our particular ideas of primary qualities do not resemble their physical causes in particular instances of sensory perception (as defended in §2.1 above). Now, the other side of this claim is that ideas of primary qualities can only be said to resemble their physical causes when considered 'abstractly' or 'in general', that is, detached from specific instances of sensory perception of objects. This is the same as to say that, when the pure intellect (as a mode of cognition opposed to sensory perception) reflects on the nature of body in general, it arrives at clear and distinct ideas of primary qualities (*i.e.* qualities that all bodies have, that is, qualities that belong to the *a priori* characterisation of matter). Crucially, the representational content of these ideas of

primary qualities formed by the pure intellect does resemble, according to Descartes, the properties of matter *out there* in the physical world.³⁰

There is textual evidence for this reading of Descartes' claims about the clear and distinct intellectual perception concerning *only* the properties of matter considered abstractly or in general. The first passages to take a closer look at are those containing the proof of the existence of body in the *Meditations* and the *Principles*. This is from Meditation Six:

So I do not see how God could be understood to be anything but a deceiver if the ideas were transmitted from a source other than corporeal things. It follows that corporeal things exist. They may not all exist in a way that exactly corresponds with my sensory grasp (*sensu comprehendo*) of them, for in many cases the grasp of the senses is very obscure and confused. But at least they possess all the properties which I clearly and distinctly understand (*intelligo*), that is, all those which, viewed in general terms (*generaliter spectata*) are comprised within the subject-matter of pure mathematics. (AT VII 80/CSM II 55, Latin terms added)

What we see in this passage is that, after presenting the core of the proof (that God is not a deceiver and therefore our ideas of external objects come, indeed, from external objects),³¹ Descartes restates the familiar problem of dissimilarity, crucially, without making a distinction between types of qualities. Rather, he is qualifying sensory perception *in general* (as 'obscure and confused' given a lack of similarity across the board), and later contrasting

³⁰ If this interpretation is correct, then Descartes' theory could be considered as no less sophisticated than Locke's.

³¹ The argument for the existence of body relies on a number of theses presented throughout the *Meditations*. Most evidently, it relies on the argument for the existence of an all-powerful, benevolent God in Meditation Three. But it is also dependent, as Garber, for instance, has pointed out, on the doctrine that the mind has only two faculties (intellect and will) and thus that all modes of mind must be either modes of the intellect or modes of the will (1992:71). The combination of these claims facilitates the first step of the proof, in which Descartes locates, by elimination, the origin of those ideas outside the *res cogitans*: 'Now there is in me a passive faculty of sensory perception (...) but I could not make use of it unless there was also an active faculty, either in me or in something else, which produced or brought about these ideas. But this faculty cannot be in me, since clearly it presupposes no intellectual act on my part, and the ideas in question are produced without my cooperation and often even against my will. So the only alternative is that it is in another substance distinct from me (...) This substance is either a body (...) or else it is God' (AT VII 79/CSM II 55).

it with the results of intellectual activity *in general*. This is confirmed by Descartes' qualification of the approach taken as 'general', presumably meaning that it concerns abstract principles and not concretely realised variations in matter. In this passage, what the meditator 'clearly and distinctly' understands is what matter is 'generaliter spectata' (AT VII 80). 'Generaliter spectata', matter is extension in length, breadth, and depth, and these properties are understood under the principles of 'the subject matter of pure mathematics'.³²

It is important to note, as Wilson does as well (1991:28), that the text from Meditation Six goes on to introduce a 'particular' approach to the examination of external objects as opposed to the earlier, general characterisation. Descartes gives the example of the sun being a specific size and shape, and he indicates that the subject lacks clarity:

What of the other aspects of corporeal things which are either *particular* (for example that the sun is of such and such a size or shape), or less clearly understood, such as light or sound or pain, and so on? Despite the high degree of doubt and uncertainty involved here... (MM AT VII 80/CSM II 55, my emphasis)

The analysis of these passages parallels the development of the proof of the existence of body found at the beginning of the second part of the *Principles*. Here, Descartes rehearses the argument again (he locates by elimination the origin of ideas of external objects outside of the *cogito*, and then he invokes an all-powerful, benevolent God). What he 'clearly and distinctly' perceives, again, is a general characterisation of matter 'which is extended in length, breadth, and depth' (Pr II 1, AT VIIIA 40/CSM I 223). Most importantly, the article finishes with a remark that would contradict all of Descartes' treatments of sensory perception if he weren't dealing here with the purely intellectual (and not sensory) apprehension of the properties of objects. For he writes:

We appear to see clearly that the idea of it (matter) comes to us *from things located outside ourselves, which it wholly resembles*. (*ibid.* clarification and emphasis added)

³² See §1 in this chapter for a qualified explanation of Descartes' notion of physics as an experimental mathematical science.

Now, given the omnipresent problem of dissimilarity, here Descartes must surely be referring by ‘it wholly resembles’ to the purely intellectual perception of objects. Lack of similarity between external objects and their corresponding sensory ideas is, indisputably, a Cartesian thesis. Although he writes here that ‘the idea of (matter) comes to us from things located outside ourselves’ (and that could imply that the idea is not formed by the pure intellect), Descartes is not saying that the idea of matter that we get by means of the senses ‘wholly resembles’ the properties of matter. The fact that this passage occurs within the proof of the existence of body puts his words under a different light. Rather, the passage condenses the issue of the causal origin of ideas. First, Descartes restates that the propensity to believe that there is a physical world *out there* is truthful, and thus that the physical world (and neither the meditator, nor God) is the causal origin of sensory ideas (‘the idea of it comes to us from external things’). Second, what we ‘see clearly’ is the purely intellectual idea of matter which, crucially, is what the meditator had to start with, right before engaging in the proof. The meditator finds that the clear and distinct purely intellectual idea of matter (as something extended in length, breadth, and depth) corresponds, and it is similar to something existing in the external world (a world that, according to the Cartesian picture, is made of the ‘objects of geometry made real’ (Garber 1992:63)).

These considerations lead us back to the issue of the representational content of ideas. While (as we have seen) the representational content of sensory ideas is dissimilar from particular external objects, and *that* makes them obscure and confused, the representational content of intellectual ideas is similar to external objects insofar as they depict the general properties of matter. That makes them clear and distinct. This description fits well not only with Descartes’ taxonomy of the mind as showed above, but also with his treatment of the notion of the objective reality of ideas. As we have seen before, objective reality refers to the property that ideas have by virtue of their capacity of representing something. As a genuine way for things to be in the mind (that is, as a genuine location in the ontological scale), objective reality, Descartes writes, needs a cause: ‘the mode of being by which a thing exists objectively <or representatively> in the intellect by way of an idea, imperfect though it may be, is certainly not nothing, and so it cannot come from nothing’ (AT VII 41/CSM II 29). The cause of an idea, therefore, is what fixes its objective reality, that is, the status of their

representational content.³³ This doctrine can assist further the distinction between faculties established in this section in the following ways:

- (1) On one hand, specific external objects fix the objective reality of sensory ideas (regardless of them being of primary or secondary qualities). Because of the nature and limitations of the ‘grasp of the senses’, those ideas end up being ‘obscure and confused’ representations of objects.³⁴ For example, since external objects have been proved to exist as genuine causes of our ideas of them, the idea of a particular sequoia has its representational content (and thus its objective reality) fixed by *that* particular sequoia, and mediated by the channels of perceptual information that are the human senses. The representational content of the idea presents a sequoia of a certain height and width, of a certain hardness to touch, of a certain brown and green tones in its trunk, branches, and leaves. Again, sensory ideas can be said to *misrepresent* the nature of their external causes, but they track them effectively for purposes other than attaining the the truths of metaphysics.

- (2) On the other hand, the objective reality of the clear and distinct idea of the properties of matter is fixed by the pure intellect, insofar as those properties are understood under the principles of mathematics and thus discoverable *a priori*. By reflecting upon the clear and distinct idea of matter, the perceiver understands that the ‘true nature’ of a sequoia is not transmitted though the senses. She understands, for instance, that what she calls the ‘green needle-like leaves’ or the ‘solid trunk’ of the sequoia are, in fact, arrangements and motions of particles of matter.

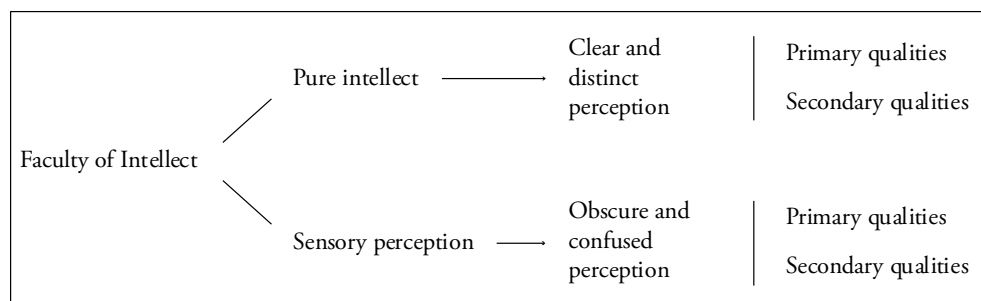
³³ This is, furthermore, what enables Descartes to construct the cosmological proof of the existence of God.

³⁴ These ideas would be, strictly speaking, ‘misrepresentations’, given that they are obscure and confused representations. It seems to me that, for Descartes, misrepresentations (sensory ideas of external objects) count as representations of their causes. They don’t represent them by resembling them, but that is, precisely, the very point of Descartes’ theory of sensory perception as revolving around the (PD).

In summary, I take the passages presented in this section to support the claim that, when Descartes ascribes clarity and distinctness to ideas of external objects, he is referring to the properties of external objects in general (that is, to the properties of matter). This mental act belongs to the pure intellect. Conversely, ideas of external objects are obscure and confused when referred to the sensory perception of concrete objects. The formation of such ideas constitutes a mental act that belongs to the intellect *as* united to the body (see Fig.4 above). This enables a reading of sensory perception as obscure and confused across the board (for both primary and secondary qualities) that is free of textual tension.

In turn, this rules out an interpretation of Descartes' theory of the cognitive structure of sensory perception along the lines of the bifurcation reading. An alternative bifurcation emerges, but it is placed between the type of information that the different faculties provide, rather than between the qualities perceived within individual acts of perception. This means that what cuts sharply along the way in which we get acquainted with the world is not a distinction between primary and secondary qualities, but a distinction between the activity of the pure intellect and the activity of the intellect *as* united to the body (*i.e.* sensory perception). Primary qualities are perceived clearly and distinctly as properties of matter ('generaliter spectata') by the pure intellect, and they are confusedly and obscurely perceived in particular instances of perception by the intellect *as* united to the body (that is, sensory perception). The same goes for secondary qualities (Fig.6 below). In §3, I will discuss the characterisation of ideas of secondary qualities as clearly and distinctly perceived by the intellect and as obscurely and confusedly perceived by the senses. I finish the present section with a brief terminological note.

Figure 6. *The cognitive structure of sensory perception*



2.2.1. A terminological note

Finally, it is worth making a minor terminological point that could assist this interpretation to some extent. Let us take it as an observation. For the portrayal of sensory perception, the expression employed in Meditation Six is ‘senso comprehendo’, (AT VII 80) which certainly can be translated as ‘the grasp of the senses’ (CSM II 55) meaning ‘what falls under their scope’ in general. This contrasts, in the same passage, with ‘intelligere’ as the verb chosen for describing the clear and distinct perception of the properties of matter which, I believe, conveys an intellectual activity with no trace of a sensory component. This would mean that Descartes is describing here what the intellect does when acting alone. And we know that the activity of the pure intellect is concerned with attaining abstract, general truths.

It could be objected to this that Descartes’ use of terminology can be somewhat erratic, so one should not read too much into his use of ‘intelligere’ as referring to the understanding, or intellection, of abstract truths. Nevertheless, a strong motivation for this terminological remark is Descartes’ persistent use, within the closed context of the *Meditations*, of ‘intelligo’ for the clear and distinct apprehension of the pure intellect. Meditation Two provides a few good examples of this use. There, the meditator delves into the nature of the mind after having casted doubt on the existence of body. The meditator finds that she can only be certain about her own existence as a ‘thinking thing’. It is at this point of the method of doubt, in which body is not part of the picture (and therefore sensory perception is not either), that Descartes expresses several times the sole activity of the intellect with ‘intelligere’. For these three passages, I have added in brackets the Latin terms originally employed:

I do not yet have a sufficient understanding (nondum vero satis intelligo) of what this ‘I’ is, that now necessarily exists. (AT VII 25/CSM II 17)

If I had tried to describe the mental conception I had of it (of body) I would have expressed it as follows: by a body I understand (intelligo) whatever has a determinable shape and a definable location... (AT VII 26/CSM II 17 clarification added)

But what then am I? A thing that thinks (...) Is it not the same 'I' who is now doubting almost everything, who nonetheless understands some things (*nonihil tamen intelligo*), who affirms that this one thing is true (...)? (AT VII 28/CSM II 19)

In summary, reading Descartes' texts while taking into consideration his taxonomy of the mind makes the bifurcation reading untenable. In this section I have showed that Descartes reserves the pair 'clarity and distinctness' for the activity of the pure intellect, regardless of the type of quality involved. In a nutshell, there is nothing particularly intellectual about the perception of primary qualities as opposed to secondary qualities. I now move on to examine in more depth the characterisation of ideas of secondary qualities.

SECTION 3. AN ALTERNATIVE CRITERION FOR A DISTINCTION BETWEEN SENSIBLE QUALITIES

Even after having established that the bifurcation in Descartes' theory is to be found between the sensory and the intellectual perception of the same qualities, it cannot be denied that clarity and distinctness are most frequently attributed in the texts to ideas of primary qualities. Consequently, one could still wonder whether this interpretation is tenable. We have seen that ideas of primary qualities can also be obscure and confused, but what it is for an idea of a secondary quality to be clear and distinct? In this final section, I start by assessing this question (§3.1). After that, I resume the issue of the rationale behind Descartes' apparent distinction in kind between sensible qualities, and I pursue an alternative interpretation that does not base the difference between primary and secondary qualities on a criterion of similarity and dissimilarity with external causes (§3.2). I conclude that this argumentation provides decisive evidence for a reading of Descartes' theory of sensory perception in which the presence of the (PD) across the board leads to the need for the activity of the mind in the formation of sensory ideas.

3.1. CLEAR AND DISTINCT PERCEPTION OF SECONDARY QUALITIES

The first part of the *Principles* provides, again, the key for understanding Descartes' position on the perception of qualities. Articles 66-69 in Book I involve the possibility of a clear apprehension of ideas of secondary qualities. Under the title of 'How sensations, emotions, and appetites may be clearly known, despite the fact that we are frequently wrong in our judgements concerning them',³⁵ article 66 specifies the following condition:

These may be clearly perceived provided we take great care in our judgments concerning them to include no more than what it is strictly contained in our perception (Pr I 66, AT VIII A 32/CSM I 216)

Descartes is introducing here an idea that has been mentioned in passing before,³⁶ referring to the fact that incorporating the notion of secondary qualities in philosophical explanation needs to be done with great caution. The condition for their clear and distinct apprehension is restated a few lines ahead:

In order to distinguish what is clear in this connection from what it is obscure, we must be very careful to note that pain and colour and so on are clearly and distinctly perceived when they are regarded merely as sensations or thoughts (*ibid.* Pr I 68, 33/217)

This means that the talk of ideas of secondary qualities remains adequate only insofar as one understands, at the same time, that there is nothing in the external world that is similar to such ideas. The caution that Descartes recommends is exemplified, as we have seen before, by the use of careful expressions such as the following: 'what we are calling colour' (*ibid.* I 70, 34/218), '<We call these qualities hardness, heaviness, heat, *etc.*>' (*ibid.* IV 191,

³⁵ Descartes often uses 'sensation' and 'sensory perception' interchangeably. Sometimes, the term 'sensation' seems to be reserved for sensory ideas of secondary qualities in general. This is the case of this passage, where the example given, a few lines ahead, is one involving colour: 'on seeing a colour, for example, we supposed we were seeing a thing located outside us which closely resembled the idea of colour that we experienced within us at the time' (Pr I 66, AT VIII A 32/CSM I 216).

³⁶ Mainly, towards the end of §1 in this chapter.

318/282), ‘the properties in external objects to which we apply the terms light, colour, smell...’ (*ibid.* IV 198, 323/285), ‘the light in bodies we call luminous’ (Op, AT VI 84/CSM I 153).

For elucidating the scope of Descartes’ claims about the clarity and distinctness of secondary qualities, I will resume here the brief analysis of the status of secondary qualities given at the end of §1 in this chapter. There, I mentioned briefly how Descartes’ verdict on the topic is embedded in his task of clarifying a systematic ambiguity in the use of terms like ‘colour’, ‘smell’, ‘taste’, and so on. Pasnau (2011) has appropriately labeled the two aspects of this ambiguity as ‘physical designation’ and ‘phenomenological designation’ of secondary qualities. I will follow this terminology from here onwards.³⁷ Let us start with the analysis of Descartes’ theory in these terms. For each designation of ideas of secondary qualities (physical or phenomenological), I provide a brief three-fold description: (a) what does the designation amount to, (b) where can we find it in the texts, and (c) what does it mean, under such designation, that an idea of a secondary quality is clear and distinct.

3.1.1. The physical designation

- (a) On one hand, the physical designation of sensations (‘heat’, ‘colour’, ‘smell’, *etc.*) indicates the nature of their physical causes, as well as the effects that these causes bring upon other physical objects (the human senses included). In the Cartesian theory, the causes of sensations are different arrangements and motions of micro-corpuscles of matter as well as the corresponding patterns impressed on the sense organs and transmitted to the brain. In this respect, the theory is a reductive one: the physical designation of sensations is nothing over and above these arrangements

³⁷ Pasnau is mainly concerned with the evolution of the distinction between primary and secondary qualities in the Early Modern period. He assesses a possible oscillation between realism and anti-realism in Descartes, but he does not deal with his account of the structure of sensory perception. I am thus borrowing a useful distinction that he makes for clarifying Descartes’ position, in this case for the different purpose of showing what it means for an idea of a secondary quality to be clear and distinct.

of matter. Consequently, the passages in which Descartes emphasises the reducibility of sensations to the properties of matter should be read under the physical designation, that is, the inquiry about their physical causes independently of the presence of a perceiver. At stake under this designation is what constitutes what we call ‘heat’, ‘colour’, ‘smell’, *etc.* in the physical world.

- (b) In the texts, we encounter the physical designation in the reduction of secondary qualities to primary ones as one of the aspects of the micro-corpuscular reduction that constitutes the programme of Cartesian physics.³⁸ It is, for instance, the overall approach taken in the *Treatise on Light* and the *Optics*. In his treatment of fire, he exemplifies the reductive view of qualities as follows: ‘I ask you to consider whether this (the motions of micro-particles) is not also sufficient for us to understand how the flame provides us with heat and light (...) the flame will need possess no other quality, and we shall be able to say that it is this motion alone that is now called ‘heat’ and now ‘light’, according to the different effects it produces’ (AT X 9/G 8 clarification added). Similarly, he remarks that colour in bodies is ‘nothing other than the various ways in which the bodies receive light and reflect it against our eyes’ (Op, AT VI 85/CSM I 153).
- (c) From the perspective of this designation, and given the reductive view, the appeal the clarity and distinctness of secondary qualities is then equivalent to that of primary qualities. Secondary qualities, in their physical designation, are clear and distinct because their ‘true nature’ (following Descartes’ frequent expression) is a reduction to the general properties of matter that the pure intellect (as opposed to the senses) can apprehend (as explained throughout §2 above). For instance, we clearly and distinctly apprehend (physical) heat when what is referred by the term ‘heat’ is a certain rapid motion of particles.

³⁸ For a general exposition of the Cartesian project, see §1 of the present chapter, as well as Chapter One.

3.1.2. The phenomenological designation

- (a) On the other hand, the phenomenological designation of sensation captures the sorts of effects that the above arrangements of matter bring about in (human) perceivers. For instance, upon perceiving an obsidian, the ‘phenomenal black’ of my experience of it is different from that which has set off the process (certain arrangements of matter) and ultimately caused the phenomenology of such experience. At stake under this designation is the status of sensations as phenomenally considered. It is important to detect this shift between perspectives in the texts in order to avoid reading Descartes as presenting a muddled account. When the human being enters the picture, the phenomenological designation sometimes takes over the physical one. That is to say, when the focus is on the experience that perceivers have of the natural world, Descartes puts aside the issue of the micro-corpustular reduction and contends that sensations should be considered as thoughts.
- (b) In those works and passages that are not centred around the scientific programme of micro-corpustularian reduction, Descartes can be sometimes seen as taking the perspective of the phenomenological designation. This is why in the *Principles* we are told that ‘pain and colour and so on are clearly and distinctly perceived when they are regarded merely as sensations or thoughts’ (Pr I 68, AT VIIIA 33/CSM I 217), and this is why this claim is not incompatible with saying that we can apprehend those pains and colours clearly and distinctly as motions of particles when using the physical designation.

In these contexts, metaphysical considerations arise regarding the status of such experiences as products of the union of mind and body. For example, to his list of ‘the ultimate classes of things’ in the *Principles*, he adds sensations as ‘things which must not be referred either to the mind alone or to the body alone. These arise (...) from the close and intimate union of our mind with the body’ (*ibid.* Pr I 48, 23/209). We had already come across this verdict concerning sensations: according to Descartes, they are the genuine products of the union of

the mind and body and, as such, they have a place in the true ontology of the world. The ‘phenomenal black’ of my experience of the obsidian is the genuine, regular, and concurrent result of the ‘physical black’ of the obsidian *out there*. One could even add that it is the ‘intended’ result given the ultimate appeal to God’s ordination in establishing the psycho-physical laws that constitute sensory perception.

- (c) From the perspective of the phenomenological designation, clarity and distinctness belong to sensations only when no judgments are attached to them about resemblance with their external causes. Sensations ‘may be clearly perceived provided we take great care in our judgments concerning them to include no more than that of which we have inner awareness’ (*ibid.* Pr I 66, 32/216). This refers to the fact that, by introspection of a sensation (that is, by inspecting that of which we have this ‘inner awareness’), we cannot gather anything about its physical causes. Any other information that we might feel inclined to attach to sensations is what Descartes commonly refers to as the mistaken judgments that we have been accustomed to make since childhood (*i.e.* that the phenomenal content of sensation resembles its physical causes).

To make this sort of judgment would not only be an unjustified move from an epistemic point of view (since we simply do not know whether sensations might or might not resemble their physical causes), but also, given Descartes’ micro-corpuscularianism, it would be a mischaracterisation of the ontological map of the world. Recall that, by disregarding dissimilarity as well as the limitations of introspection, the threat of ‘material falsity’ appears. In other words, we could be misrepresenting ‘things as non-things’. This means that we would be misplacing the phenomenal content of sensation as a ‘real quality’ in the physical world (perhaps as supervening on primary matter following the Aristotelian-Scholastic model that Descartes wants to replace). In sum, sensations can also be apprehended with clarity and distinctness when we consider them without judgment, that is, as unprocessed modes of mind.

3.1.3. Consequences of a reading of designations

These two perspectives —the physical and the phenomenological— coexist in the texts and generate different claims that could, in a first instance, be read as pertaining to different positions concerning qualities.³⁹ Claims made under the physical designation could be seen as clashing with Descartes' type of anti-realism about qualities. For example, in the wax thought experiment in Meditation Two, Descartes states that colour, taste, and smell do not 'belong' to the wax.⁴⁰ Similarly, in the *Principles*, he declares that a stone (or any body) lacks colour, hardness, and heat.⁴¹ In light of the distinction between designations, however, we know that (in spite of the brevity of some his explanations) Descartes is referring here to qualities considered phenomenally. Certainly, 'phenomenal smell' does not belong to the physical wax and 'phenomenal heat' does not belong to the physical stone.⁴² But this does not mean that the phenomenological experience of sensible qualities amounts

³⁹ I think that Nolan (2011) and Wilson (1992) have mischaracterised Descartes' position to some extent precisely because of this, although their verdicts differ. While Nolan defends a nominalist reading of Descartes on secondary qualities, Wilson identifies conflicting views within the texts. On my reading, there is more than a nominalist stance in Descartes' view on secondary qualities, and the seeming conflict can be explained away by distinguishing the use of the two designations.

⁴⁰ 'The wax was not after all the sweetness of the honey, or the fragrance of the flowers, or the whiteness, or the shape, or the sound (...) Let us concentrate, take away everything which does not belong to the wax, and see what is left...' (MM, AT VII 30-1/CSM II 20)

⁴¹ 'We first of all exclude hardness, since the stone is melted or pulverized it will lose its hardness without thereby ceasing to be a body; next we will exclude colour, since we have often seen stones so transparent as to lack colour; next will exclude heaviness, since although fire is extremely light it is still thought of as being corporeal; and finally we will exclude cold and heat and all other such qualities, either because they are not thought of as being in the stone, or because if they change, the stone is not on that account reckoned to have lost its bodily nature' (Pr II 11, AT VIII A 46/CSM I 227)

⁴² Cottingham has made a similar point in his analysis of Descartes' arguments for the non-inherence of colour: 'a sensible property, such as redness, *construed as a disposition to set up certain types of motion*, may genuinely inhere in objects. What is denied is the inherence of redness *qua* redness - redness construed as a certain sort of *sui generis* quality supposed to inhere in objects in a way that exactly matches our sensory awareness of it' (1989:238). The aim of Cottingham's paper is to delineate a concept of inherence that Descartes could have held. For that, he rightly examines some aspects of the problem of dissimilarity (as it is illustrated by the quotation), but he does not analyse the possibility that Descartes' position extends to *all* qualities. This makes him mischaracterise some aspects of the theory, as I specify elsewhere.

to nothing, not even to an unwanted perceptual delusion that reveals the inherently faulty nature of human beings.

Furthermore, if one disregards the distinction of designations in the texts, Descartes could be read as putting forward a sort of anti-realism about qualities that emphasises a total disconnection between what happens in the world and what happens in the mind as a result. This could pave the way for strong occasionalism as the type of causal transaction between external objects and ideas that would be undesirable given Descartes' general theory (as presented throughout Chapters One, Two, and Three).

In this section I have showed that in Descartes' theory for the cognitive structure of sensory perception there is a place for ideas of secondary qualities considered clearly and distinctly. First, insofar as they are physical occurrences reducible to primary qualities, they are clear and distinct in the technical sense of being apprehended by the pure intellect as characterisations of matter considered in general. This is the same sense in which ideas of primary qualities are apprehended with clarity and distinctness. Second, as genuine mental occurrences connected with physical states by means of psycho-physical laws, they can be said to be clear and distinct in a more flexible sense. Descartes means, I believe, that we can understand clearly the phenomenology of sensation when we detach from it judgments about similarity with external objects, which are epistemically unjustified and ontologically faulty. In summary, this completes a unified picture of the cognitive structure of sensory perception in Descartes.

In the following, final section of this chapter, I will deal with a loose end of this proposal. I am aware that one might readily object that if ideas of primary and secondary qualities are genuinely on a par, as I have argued throughout this chapter, it makes no sense to have focused on a special formulation of the problem (the distinction between designations) devised only for ideas of secondary qualities. In other words, if ideas of primary and secondary qualities are equally affected by the (PD), it is an inconsistency to attribute a disjunction between physical and phenomenological perspectives *only* to ideas of secondary qualities. This is why, I believe, the most important upshot of the argumentation presented in this section is that the distinction between physical and phenomenological perspectives

should be applied to both types of qualities. There is no ‘phenomenal black’ in the obsidian *out there* and, similarly, there is no ‘phenomenal size and shape of the sun’ in the sun *out there*.⁴³

If this is true, at least two pressing questions arise. (1) First, if Descartes held, in fact, that *all* qualities are subjected to the same bifurcation between clear and distinct perception by the pure intellect and obscure and confused perception through sensory perception, why did he emphasise much more consistently the (PD) for the case of sensations (ideas of secondary qualities)? (2) Second, even if the first question can be successfully resolved (and I think it can), a distinction between types of qualities transpires from the way in which Descartes presents the topic of the perception of qualities. They are often listed separately, and assessed in different sections in works in which thematic divisions are used (like the *Principles*). Why make a division if qualities are equally affected by the (PD)? I think that it is charitable to assume that, if dissimilarity between ideas and their physical causes is not what cuts across between types of qualities, there needs to be another reason that justifies Descartes’ split exposition of the topic. I address these questions in the following section.

3.2. THE CRITERION FOR A DISTINCTION OF QUALITIES

We have seen that, along general lines, Descartes’ doctrine is that ‘all variety in matter (...) depends on motion’ (Pr II 23, AT VIII A 52/CSM I 232), and that ‘there is nothing whose true nature we perceive by the senses alone’ (*ibid.* Pr I 73, 37/220). At the same time, however, it is a textual fact that, in his account of sensory perception, Descartes entertained the (PD) with special emphasis for the case of ideas of secondary qualities. This association

⁴³ The allusion of the sun refers to the crucial example in Meditation Three: ‘I think I have discovered a great disparity <between an object and its idea> in many cases. For example, there are two different ideas of the sun which I find within me. One of them, which is acquired as it were from the senses and which is a prime example of an idea which I reckon to come from an external source, makes the sun appear very small. The other idea is based on astronomical reasoning, that is, it is derived from certain notions which are innate in me (...) and this idea shows the sun to be several times larger than the earth. Obviously both these ideas cannot resemble the sun which exists outside me...’ (AT VII 39/CSM II 27)

is not exclusive, as I have showed in previous sections. Indeed, it is also a textual fact that he contemplated some cases involving primary qualities, and it is most important to note how the whole theory is modelled around a notion of the ‘true nature’ of bodies as something that only the pure intellect can grasp.

Nevertheless, even taking this into account, it is unmistakable that a distinction between types of qualities emerges from the texts. The rationale behind this distinction is unclear given what I take to be Descartes’ position *i.e.* that ideas of primary and secondary qualities are on a par from a cognitive point of view, and that, therefore, dissimilarity is a problem for both of them. In this section I will assess Descartes’ tendency to highlight the (PD) for secondary qualities, and I will suggest an alternative criterion for a distinction between types of qualities.

Descartes did not provide a systematic treatment of the distinction between qualities. I believe, nonetheless, that it is possible for the interpreter to reconstruct a plausible story that, on one hand, fits well with Descartes’ omnipresent concern about the (PD) and, on the other, accounts for some problematic features unique to ideas of secondary qualities. In short, I will contend that the rationale behind the distinction of qualities is a difference in the way in which ideas of them misrepresent their physical causes. I will rely on some of the insights by Simmons (2003) and Hatfield (2005) that I will point out accordingly.

The first step in the argumentation is that if ideas of primary and secondary qualities are on a par from a phenomenological point of view, then this means, in a consistent account, that the criterion for a distinction between qualities should be phenomenologically irrelevant. That is to say, there should not be anything discoverable by introspection (by ‘inner awareness’ of the sensation, as Descartes would say) that would, in fact, reveal the distinction in question. The second step in the argumentation is simply to recall that, for Descartes, *both* ideas of primary and secondary qualities misrepresent (though they accurately track) their physical causes. From these standpoints, I think that the most fruitful approach is to examine in finer detail how sensory ideas misrepresent bodies and whether they all misrepresent bodies in the same way.

Let us take the example of the idea of the sun that Descartes puts forward in Meditation Three. The sensory idea of the sun ‘makes the sun appear very small’ (AT VII 39/CSM II 27). Most importantly, the sensory idea of the sun does not convey anything about the arrangements and motions of matter that constitute it and make it appear as a round, solid, luminous star. The ‘phenomenal sun’ has, for instance, a different size and width than the actual sun. Perhaps, depending on the perceptual conditions, our sensory idea misrepresents the sun as a circle, or as an oval, when it is in fact an almost perfect gigantic sphere. Similarly, the ‘phenomenal sun’ exhibits a variety of colours. For example, my idea of the sun at sunset presents it in orange tones when, in fact, there is no such thing as ‘phenomenal colour’ in the absence of a human perceiver of the sun. Note, however, the following difference.⁴⁴ The general quality that is misrepresented in the former case (width, for instance) constitutes a misrepresentation of the sun, and the sun only. Width is a property that objects *can* have, and it is possible that there is some object *out there* that is a circle, or an oval instead of a sphere. The sun does not have the width presented phenomenally, but has some width or other independently of the perceiver, even if that width is only present at a micro-corpuscular level. In contrast, the general quality that is misrepresented in the latter case (colour), misrepresents the sun, but *not only* the sun. It constitutes a misrepresentation (that is, an obscure and confused representation) of what matter is like as a whole. There is no (phenomenal) orange in the sun at sunset, just as there is no (phenomenal) orange anywhere else in the physical world. Colour, under its phenomenological designation, is simply not the type of quality that bodies have independently of perceivers.

I believe that this is the rationale behind Descartes’ distinction between types of qualities. This distinction along the lines of conceivability of qualities as existing in physical objects provides a charitable, plausible reading of Descartes’ position throughout the texts. Under this reading we can have a more qualified understanding of some of Descartes’ remarks about perception of primary qualities, such as the following from the *Principles*:

⁴⁴ This difference has been stated by Simmons (2003:570) with slightly different implications. I detail this in the upcoming paragraphs.

The mind perceived sizes, shapes, motions, and so on, which were presented to it not as sensations but as things, or modes of things, existing (*or at least capable of existing*) outside thought...’ (Pr I 71, AT VIIIA 36/CSM I 219, my italics)

There are many other features, such as size, shape, and number, which we clearly perceive to be actually *or at least possibly* present in objects...’ (*ibid.* I 70, 34-5/218, my italics)

This interpretation has two main advantages in respect to a traditional interpretation of the separation between qualities in terms of resemblance/lack of resemblance between ideas and their specific physical causes. First (1), it offers a way of establishing the distinction between types of qualities that maintains a dissimilarity between specific ideas and their specific physical causes as a perceptual occurrence for all qualities (not only secondary). Second (2), it captures, at the same time, a way in which ideas of secondary qualities are more problematic, thus justifying Descartes’ tendency to treat them separately and list them frequently when the (PD) appears.

Furthermore, I think that the reading also explains one particularly obscure expression of Descartes in the *Comments*. In the midst of his most explicit account of hyper-nativism,⁴⁵ Descartes declares that ‘ideas of pain, colours, sounds, and the like must be *all the more innate*’ (AT VIIIB 359/CSM I 304 my italics).⁴⁶ In the context of the *Comments*, it is clear that dissimilarity is taken as a main motivation for the need of mental activity in sensory perception, but it is not clear where this distinction between types of qualities comes from, given that dissimilarity is a problem across the board.⁴⁷ In light of the interpretation presented in this section, we can understand that it is because ideas of secondary qualities misrepresent the properties of matter (and not only of a given specific object of perception) that Descartes declares that they must be innate with greater reason. ‘All the more innate’

⁴⁵ This is explained at length in Chapter Three.

⁴⁶ The original Latin reads: ‘Ac tanto magis innatæ esse debent’

⁴⁷ Recall that in the same text Descartes affirms, for instance, that ‘there is nothing in our ideas which is not innate to the mind’ (CB, AT VIIIB 358/CSM I 304).

expresses, even if not in a technical manner, that it is beyond doubt that the mind needs to be doing some work in their case.

Before going any further, it should be said that Simmons (2003) has offered a similar interpretation, although she has argued for it, broadly, from the notion of material falsity. The scope of her proposal, then, ends up being different. If I have read it correctly, Simmons' position is that the reason that Descartes has for emphasising the further complexity of qualities such as colour is that they provide more material for error. This means that, for the case of ideas of secondary qualities, to follow the habitual, erroneous tendency of assuming that ideas of sensory objects resemble their physical causes⁴⁸ would make us fall into the kind of category mistake that Descartes calls material falsity. To make a judgment about similarity would be wrong for both types of qualities, but in the case of secondary qualities, the error would be more serious. She puts it as follows: 'projective judgments about secondary qualities, therefore, lead us into error not only about the particular properties of bodies, but also about the very nature of body in general' (2003:570).

This is certainly the right conclusion regarding the scope of material falsity. But I have argued for a claim that is slightly more fundamental. The threat of material falsity varies with the types of qualities precisely *because* a distinction between qualities is determined by the fact that, while they all misrepresent the nature of bodies, they misrepresent it to different degrees. To those acts of sensory perception (recall, bodily induced acts of the faculty of intellect), the faculty of the will might or might not attach a projective judgment that mischaracterises the nature of *one* or *all* objects. In other words, a distinction of types of qualities does not depend on whether a specially misled judgment is made, but it precedes such a judgment: it is a fact about the nature of sensory perception itself.

⁴⁸ Simmons (2003:553) calls this type of judgment about the materials given by the senses 'projective', and she distinguishes it from the 'constructive' kind. The former indicates the erroneous tendency to judge that our sensory perceptions resemble their physical causes. The latter refer to the kinds of judgments that collaborate in constructing the phenomenological experience of the world that we have as embodied beings (that is, as minds united to bodies in an essential manner).

As a final point, I mentioned before that if it is true that primary and secondary qualities are on a par from a phenomenological perspective, a consistent theory should include a rationale for the distinction of qualities that does not play a role in Descartes' phenomenology of sensation. Therefore, an important feature the reading presented in this section is that it provides a distinction between qualities that does not have a place in the phenomenology of sensation. Note that the different degree to which ideas of primary and secondary qualities misrepresent the physical world is simply irrelevant from a phenomenological point of view. It is simply not something that is revealed when 'attending' a sensory idea, as Descartes would put it. Let us now unpack this claim a bit more.

We know that, within the Cartesian theory, sensory ideas are described as the regular effects of physical objects and their corresponding brain states in the mind. When those effects are ideas of secondary qualities, it is common perhaps to assume that what characterises them is that they do not provide any information about their physical causes. That is to say, what the perceiver is aware of phenomenally does not 'reveal anything about either the brain state or the micro properties of distant things' (Hatfield 2005:43). This does not render the connection between objects and ideas irremediably unintelligible for the natural philosopher (who can, in principle, discover natural ordination), but it certainly makes it opaque for the perceiver.

The different arguments that I have presented throughout this chapter have culminated in the claim that ideas of primary qualities do not provide any information about their specific causes either. The natural philosopher, in this case, is the one who seeks knowledge of the correspondences between objects, brain states, and ideas. Hatfield (2005) has made the point that the theorist, and not the perceiver, is the one who can, in principle, detect the difference between qualities. The theorist understands that the fact that sensory perception, in its physical phase, depends on patterns of motions transmitted from the object through the nerves and to the brain, means that ideas of primary qualities misrepresent the object but not the (motion-reducible, geometrically derived) properties of matter. In principle, by getting to know certain rules of 'misrepresentation', the theorist could infer objects and brain patterns from ideas, and she would arrive at the conclusion that ideas of primary

qualities misrepresent their specific physical causes, but they involve qualities that objects can have. The same method goes for ideas of secondary qualities, with the different conclusion that they involve qualities that physical objects cannot have. In principle, then, the theorist could look into the pattern imprinted in the brain and infer the presence of an object or other. But for both primary and secondary qualities, she would have to know about the psycho-physical laws that constitute sensory perception. Sensible qualities are, across the board, phenomenologically opaque.

Recall, before wrapping up this topic, Descartes' emphasis on the fact that the relation between the brain and the mind in sensory perception does not involve an inspection of brain states 'as if there were yet other eyes within our brain with which we could perceive it'. (Op AT VI 130/CSM I 167)⁴⁹. Aside from being a straightforward criticism of an Aristotelian-Scholastic account of sensory perception, this also adds to the Cartesian theory the claim that epistemic access to brain states is simply not something that is available to the perceiver *qua* perceiver. Even when there is some sort of similarity (in terms of traceable motion patterns that exhibit properties that matter *can* have), this has no bearing on the perceptual process. Descartes is also clear about this particular point in the same textual context, without making a distinction between qualities: 'we must not think that it is by means of this resemblance that the picture (the isomorphic representation in the brain) makes us sense these objects' (*ibid.* 130/167 clarification added).⁵⁰

The irrelevance of resemblance (since we cannot access it in any case) is further emphasised by some of Descartes most anti-empiricist remarks in the *Principles*, such as the following: 'sensory perceptions (...) do not, except for occasionally and accidentally, show us what

⁴⁹ He had also written a few paragraphs before: 'we must take care not to assume -as our philosophers commonly do- that in order to have sensory perceptions the soul must contemplate certain images transmitted by objects to the brain' (Op, AT VI 112/CSM I 165).

⁵⁰ The CSM translation reads 'the picture causes our sensory perception of these objects', whereas the original French reads 'ce soit par le moyen de cette ressemblance qu'elle fasse que nous les sentons'. Following the point made in Chapter One about the significance of the absence of the word 'cause' in descriptions of brain-mind interaction, I have altered the translation to 'make us sense'.

external bodies are like' (Pr II 3, AT VIII A 41/CSM I 224).⁵¹ I believe that this quotation illustrates well the finesse of Descartes' view: similarity can certainly occur in the process of sensory perception, but it is not, nevertheless, a causal factor. It is not common, it happens by chance, and it is, at any rate, irrelevant to the perceiver.⁵²

In conclusion, in this final section I have established that the distinction of particular sensible qualities that transpires from Descartes' texts does not have a rationale based of their similarity or dissimilarity with external causes. The criterion for a difference of qualities arises from an analysis of the nature of misrepresentation in sensory perception, and it hinges on the matter of conceivability. Most importantly, this reading provides a way of making sense of Descartes emphasis on the (PD) in the case of ideas of secondary qualities that does not, at the same time, obstruct a unified theory of sensory perception with a significant role for the causal efficacy of the mind.

CONCLUDING REMARKS

In this final chapter, I have developed a line of thought to the effect that an approximation to the Cartesian theory of sensory perception from the viewpoint of the analysis of sensible qualities (and not complete objects) also supports the thesis of the activity of the mind. The different arguments offered support the position that the weight

⁵¹ This point is somewhat surprisingly missed by Cottingham in his account of Descartes on colour. There, he uses this same passage to claim that it only concerns ideas of secondary qualities. There is nothing in the context of this passage suggesting this association. Cottingham writes: 'the conclusion that we are invited to draw is that sensory perceptions like those of colour 'do not tell us except occasionally and accidentally what bodies are in themselves' (1989:232).

⁵² It is important to note that, if ideas of primary qualities misrepresent *only* the particular cause of an idea, but not the properties of matter in general, it is possible, at least in principle, that in some case, by chance, a combination of arrangements and motions of matter generates an idea that represents the general properties of matter and also *happens to represent* the properties of its particular cause. In light of Descartes' affirmations, this fortuitous event would not say anything about either the process of sensory perception or the phenomenology of sensation. Simmons (2003) has made a similar point concerning projective judgments. Even in cases where an idea resembles in some sense its physical cause, we would be assuming (projecting) similarity between object and idea for the wrong reasons. Those judgments, though correct, would be a matter of epistemic luck (2003:570).

of the (PD) structures the different aspects of Descartes' account of perception, the distinction between qualities included. As we have seen throughout this dissertation, the (PD) determines Descartes' carefully balanced causal narrative (as developed in Chapter One), it prompts a causal-semantic model for brain-mind interaction that builds-in the phenomenon of dissimilarity and that it is concerned with the interpretative activity of the mind (as presented in Chapter Two), and it presses Descartes to take an innateness strategy to account for a different, complex type of mental content that differs from his standardly considered innate ideas (as explained in Chapter Three). In Chapter Four I have stressed that ideas of primary and secondary qualities are equally subjected to the phenomenon of dissimilarity. Rather than resulting in a major inconsistency, Descartes' opposition between the clarity of intellectual perception and the obscurity of sensory perception has revealed a refined account of the cognitive structure of sensory perception. In the picture of sensory perception that comes into view, incorporating now an examination of particular qualities of objects, the mental activity thesis remains a compelling interpretation.

CONCLUSIONS

This dissertation is shaped around a defence of the position that, in Descartes' theory of sensory perception, the mind is active in the sense of contributing to the representational content of ideas. In this regard, the work that has been presented here counters a pervasive reading of Descartes according to which the mind is a passive receiver from inputs of the environment. As a historical inquiry, this project aims at revising a specific aspect of the European early-modern history of ideas. In an account of the genesis of the concepts that have determined the modern and contemporary understanding of perception, Descartes is commonly associated with an unrefined dualism that does not spark much interest to the current philosopher. The work that Descartes put into the theory of sensory perception, however, is rather remarkable. Not only did he devise a complex mechanistic physiology for it throughout his works on natural philosophy, but he also strived to provide a naturalistic and metaphysically interesting theory for the production of mental content in sensation. Throughout this project, I have offered four main lines of argument (one for each chapter) that support the view that Descartes summoned the mind for a substantial task in sensory perception. While sustaining the mental activity thesis, these four argumentative lines have themselves modelled a specific theory of the activity of the mind. I summarise here the four conclusions that they have provided.

The first chapter supplies a theoretical framework. I identify the Problem of Dissimilarity (PD) between mental representations and mechanistic explanations as Descartes' main concern about sensory perception, as well as his chief motivation for introducing mental activity. In Descartes' descriptions of the qualitative gap of sensory perception, we observe a carefully established terminological equilibrium in the way he writes about types of causal transactions. I concluded that Descartes' choice of words reveals the presence of a cause of a non-efficient kind that appears consistently for accounting for the qualitative character of sensory perception. The second chapter furnishes this scheme with a textually plausible causal-semantic model. In this model, brain states are assimilated to natural signs of external objects. An important upshot of this reading is that it incorporates well both the (PD) and the

resultant activity of the mind that Descartes seem to suggest in different manners throughout. In this picture, sensory ideas are semantic responses that are formed by virtue of the pre-cognitive interpretative activity of the mind.

The third chapter integrates Descartes' claims about the innateness of all ideas into the theory of sensory perception. This is an important piece of a defence of a mental activity reading because Descartes invoked the category of innateness to formulate the type of mental content that is produced by the mind in sensory perception, and that cannot be identified with its bodily causes. The conclusion is that hyper-nativism (that is, the thesis that in a way *all* ideas are innate) amounts to Descartes' endorsement of mental activity from the standpoint of a theory of types of ideas. An important piece of this vein of thought is that it provides a reconciliation of the different (and seemingly clashing) taxonomies of ideas advanced by Descartes.

Finally, the fourth chapter aims at the resolution of a glaring textual tension. For doing that, it shifts the perspective to that of the perception of sensible qualities of objects. The way in which Descartes often characterises ideas of primary qualities —as clearly and distinctly perceived by the intellect— appears to compromise a reading of sensory perception as incorporating mental activity. It would seem that causal-semantic model that incorporates mental activity as a result of the (PD) is envisaged for dealing only with the puzzling nature of secondary qualities. Nevertheless, the analysis of Descartes' distinction between types of qualities shows that there is no such bifurcation in specific acts of sensory perception. This argument completes a unified picture of Descartes' theory of sensory.

In the course of these argumentations, I have witnessed the opening of new paths of research that I inevitable could not take up. For example, the role of God and the status of natural ordination within a causal-semantic model remain as a topic to explore in more depth. Also, the presence of Descartes' qualified explanatory naturalism across is worth investigating properly. On the face of it, it seems to be a promising way to understand Descartes' dualism in consonance with his experimental natural philosophy. Lastly, I have given only a cursory treatment of the ontological status of sensation, which appears as one of Descartes' the most ambiguous (yet forward) proposals.

At any rate, these open paths for investigation reveal the potential of the history of philosophy. In this dissertation, I have also attempted to show the value and the scope of historically grounded philosophy, as well as the constructive, worthwhile exercise of taking an alternative path. The causal-semantic model of sensory perception, together with its inseparable companion of mental activity, have illustrated, I believe, the possibility of rediscovering small yet fascinating pieces of intellectual history.

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