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# Monstrosity and the Limits of the Intellect

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## Philosophy as Teratomachy in Descartes

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### Introduction<sup>1</sup>

One of the main elements of the scientific paradigm of seventeenth-century mechanism was the formulation of a limited number of simple laws or rules. This effort was aimed at collecting the multiplicity of phenomena and the virtually infinite plurality of the observed reality under their interpretative umbrella. To do this, it was both necessary and desirable to leave aside singular and exceptional cases in order to construct instead a general normativity that embraced reality as a whole. Descartes was one of these philosophers whose interest was unequivocally focused on the rule as a description of the general course of things. His interest, that is to say, was in the rule rather than the exception, in physiology rather than pathology, and in normality rather than monstrosity.

However, despite this explicit methodological approach, Descartes' entire work is haunted by phantoms, oddities, and monstrosities. Between metaphors and analogies, like a phoenix, the monster rises up continuously in the works of Descartes. What I suggest in this article is that Cartesian philosophy as a whole is a 'teratomachy': a war, in other words, waged against a certain idea of monstrosity. The fact that monstrosity remains alluded to, often only hinted at and apparently peripheral, does anything but diminish its importance. On the contrary, its allusional character stimulates the interest of the reader in the use of these tropes and adds to their hermeneutic depth.

The monster is constantly pushed to the margins by Descartes, yet remains the main challenge both to his thought and to the new philosophy, neither of which could afford the luxury of leaving any phenomena unexplained. The monster is therefore evoked, touched upon, and then embraced and neutralized with powerful metaphors whose function is

precisely to disempower its subversive character. Our task, then, is to analyze the various figures of monstrosity in order to shed light on one of the main theoretical problems of the mechanistic philosophy as it traversed the entire seventeenth century.<sup>2</sup>

In my view, monstrosity has a rhetorical significance in Descartes that is anything but marginal, along with a theoretical function of the utmost importance. Its meaning can be explained only by understanding the polemical movement out of which it arose: in the tension, that is, between the need to marginalize and neutralize monstrous exception, and the explicit intention to use it theoretically so as to confirm the rule and the normal. This is not a contradiction on the part of Descartes. On the contrary, it is a necessary and productive ambiguity that points to the need to use to his own advantage one of the most challenging theoretical challenges of seventeenth-century mechanistic philosophy.

This ambiguity is particularly apparent in his writings on medicine, embryology, and physiology.<sup>3</sup> Critics have repeatedly stressed the limits of Cartesian philosophy in these fields. Without wishing to step into the shoes of the "avocat attardé de la cause cartésienne" suggested by Pierre Mesnard in the late 1930s,<sup>4</sup> I believe that these limits are more interesting if interpreted as productive tensions arising from the spirit of the new era, rather than as signs of backwardness or delays in an imagined history of scientific achievements, or stories of "magnificent and progressive fates." Even so, we still need to pinpoint the moment when these kinds of tensions begin to give rise to real difficulties in a system. In his highly perceptive analysis of the work of Gueroult, George Canguilhem gave a very good description of this overlap of productive tensions and hermeneutic difficulties in Cartesianism, offering at the same time an important lesson on historical method.<sup>5</sup>

In an incisive analysis of theodicy in the time of Descartes, Sergio Landucci, in his turn, has shown that there is an implicit tension between the content of the Fourth Meditation, and the final part of the Sixth Meditation. This ambiguity allows for two opposing solutions to the theme of "evil" and its justification within the Cartesian system. On the one hand, we have Leibniz extolling the perfection of creation in an effort to take what we might define as an Augustinian view to its extreme consequences. On the other, we have Malebranche and then Bayle who instead overturned this view to exalt the wisdom of the Creator, at the cost of admitting imperfection into the created world.<sup>6</sup>

Now, although the link between "evil" and "monstrosity" is evident, I do not believe that the two concepts fully coincide. To interpret the monster only as a particular case or special application of a more general concept of evil diminishes its theoretical and scientific interest. The theological problem of the justification of the created world does not correspond exactly to the

physical violation – real or apparent – of the rules and laws through which nature works. Without providing a precise definition of monstrosity,<sup>7</sup> therefore, I suggest that its study must be intertwined with the problem of theodicy, opening up the inquiry, however, onto further points of philosophical and scientific interest.

In order to show this, I will first analyze the main figures of monstrosity in Cartesian philosophy, showing their rhetorical impact and theoretical function. I will explain how they are essential to the very foundation of the Cartesian system. The notions of the evil genius and the deceiver God, which must be considered separately within the broader issue of theodicy, instead converge and join forces in the two-faced figure of radical monstrosity. It is a figure to which the Cartesian subject must respond forcefully in the search for a cornerstone to hold up the entire system. This inquiry will necessarily entail an examination of the peculiar status that Admiration holds in the Cartesian economy of the passions. On the one hand, Admiration draws constantly on the conceptual sphere of monstrosity; on the other, it moves towards a positive knowledge of the rare and "singular".

I will also analyze a passage from the *Cogitationes circa generatione animalium*, the only text in which Descartes explicitly discusses physical monstrosities. I will argue that these pages, in which Descartes subscribes to a rigidly mechanistic, epigenetic view of embryology, are in tension with other parts of his work, especially with the doctrine of final causes and the idea of continuous creation. The theme of monstrosity is thus revealed as a tool for assessing the internal coherence of Cartesian thought.

## ***Divertissements* and true knowledge**

Descartes is probably the first philosopher of the modern age to use juridical terminology in a systematic and conscious way to describe mechanical phenomena. Starting from the early 1630s, and in particular with the *Le monde*, Scholastic philosophy was systematically put into question, not only with regard to its content, but also and especially with regard to its language.<sup>8</sup> It was in the language of laws, norms, and rules that the metaphorical constellation serving as a backdrop for rational mechanics, and more generally for the philosophy of the new era, began to be expressed.<sup>9</sup>

But Descartes did not limit himself to the use of legal metaphors. Legal language was also assigned the essential function of mediating between the new image of nature and the new science whose task it was to describe it.<sup>10</sup> Descartes was also, therefore, among the first to explain what a law is, how it depends on God and how it is impossible – despite His absolute freedom – that this world or others be subject to a different kind of normativity. In the Cartesian lexicon, the law became the key to understanding nature and its

necessity. Knowledge of causes – the only one that made sense in the new scientific context – necessarily had to be attained by describing the general laws by which phenomena are produced.

The question of investigating general rules rather than focusing on the exceptions and special cases typically pursued by the previous philosophy is at the heart of the Cartesian research program from the time of the *Recherche de la vérité*.<sup>11</sup> Descartes does his best to stage the opposition between a method of inquiry that heads directly to the gathering of general rules versus one that dallies with unique and exceptional cases, unnecessarily delaying the progress of knowledge.<sup>12</sup> Epistemon insists on knowing more about some of the “special” difficulties in each science, such as human contrivances, apparitions, illusions and all the marvelous effects attributed to magic. Not so that he can become a magician, by any means, but “in order to prevent our judgement from being beguiled by wonder at something of which it is ignorant”.<sup>13</sup> Descartes leaves the matter suspended here, and Epistemon’s questions remain unanswered. The philosophical and scientific program of Eudoxus, on the other hand, is set out in clear terms.

Human life has objective limits. An economy of knowledge must thus be constructed with care, without dissipating the little energy we have at our disposal. It would be folly to pass over the most useful and necessary things to learn how to speak “Swiss” or “Lower Breton” or, even worse, to study all the herbs and stones that come from the Indies, behold the Phoenix, and, in short, all the marvels of nature.<sup>14</sup> A “science” of the monstrous would fall under this category, but would be vain *curiositas* and an unnecessary waste of energy. Better then to cast doubt on these things, cast doubt on everything, and rebuild the foundations of knowledge, not on the accumulative “plenitude” of sterile erudition, but on the emptiness of a radical doubt that has little or nothing to do with marvels, monstrosities, miracles, and prodigies. The uncertainty caused by doubt – continues Eudoxus – may make you afraid. But it is like the empty images that alarm us in the dark of night: if we flee them, they follow us; but if we approach them, as if to touch them, our fear vanishes in an instant.<sup>15</sup>

There is undoubtedly a “science of miracles”, which can even be considered a part of mathematics and which serves to reveal the illusions that the magicians claim to produce using demons. Descartes speaks to Mersenne about this in the Fall of 1629. Even though he despises these things, they could at least serve as a pleasant (although useless) *divertissement*.<sup>16</sup> Better in any case to leave aside these chimeras, monsters and phantoms of all sorts, to turn to the construction of a system which only has room for general rules, universal experiences, and normal phenomena.<sup>17</sup>

That is why the exceptional, the miraculous, and the monstrous apparently remain outside the system. There is simply no place for them, because they are neither useful nor interesting. This is where early

mechanism differs substantially from its fully mature version. Distinguished Cartesians in subsequent decades will feel obliged to amply and explicitly address monstrosity, understood as the "exception" that puts the system to the test and which, therefore, demands an explanation.<sup>18</sup> The rule is saved from the exception only to the extent it is able to explain, justify and take the exception into account.

And yet, the monster reappears when we least expect it. For example, alongside the peaceful, carefree walks along the canals of Amsterdam, another image of the philosopher begins to emerge. He presents his philosophy as a veritable war against monstrosity. With determination, he enters into the labyrinth of ignorance. Armed with the weapons of the new method, he adventures where no one has dared to go before, to confront the monster of ignorance face to face and eventually defeat it: "In hoc uno totius humanæ industriæ summa continetur, atque hæc regula non minus servanda est rerum cognitione agressuro, quam Thesei filum labyrinthum ingressuro."<sup>19</sup>

Once again, the monster is not named, yet the reference is clear. This hunting expedition against the Minotaur of ignorance, a monstrous metaphor of erring reason, of knowledge based on affirmations which lack a method, is no less violent than Plato's attack on the Sophists expressed in terms of fishing. The battle Descartes wages against this type of monstrosity, which lies hidden in his prose, is precisely what we need to bring to the surface. In order to grasp the exact rhetorical and hermeneutic function of monstrosity in his philosophy, we need to reactivate what he himself deployed to neutralize, tame, and finally destroy it.

## **The Center and the Periphery: The Function of Anomalies in Cartesian Philosophy**

To define the theoretical scope of monstrosity for someone like Descartes who rarely speaks of it directly, and who consciously strives to relegate it to the margins of his system, entails a particular interpretative strategy. In the following section we will bring into view the theoretical value of monstrosity, and even more importantly, we will directly address its polemical scope. As we shall see, the only way to define the concept of monstrosity is by allowing it to emerge out of the conflictual movement which tends to eliminate it. One of Descartes' undertakings is to reject the monstrous, to exile it beyond the margins of a method concerned with the general laws of the universe.

This objective is only partially achieved, however. In reality, the monstrous continues to lay siege to the entire system, from the outside, and to threaten the system with its theoretically subversive potential. Descartes is fully aware of this polemical tension. To safeguard the *esprit de système* he

is perfectly willing to expel the singular, the rare and the monstrous from his inquiry. But, at the same time, he is quite cognizant of the immense theoretical implications that the problem of monstrosity poses to the mechanical philosophy. His challenge, therefore, is to "tame" these figures, at the same time neutralizing their potentially subversive character and putting them to work by giving them a positive function: the function, namely, of explaining and confirming the rule to which they claim to be the exception.

This tension runs throughout all the major works of Descartes, as well as through his correspondence. Although man does not understand many of the things in the world, "it would be irrational for us to doubt what we do understand correctly just because there is something which we do not understand and which, so far as we can see, there is no reason why we should understand."<sup>20</sup> What we do not understand is not essential and does not put into question what is clearly understandable. The exception, therefore, is marginalized. It is driven outside the core of the system, to a place where it is rendered harmless because it does not require any further investigation.

At the same time, however – and this is a symptom of the productive tension and ambiguity at work in Cartesian thought – he strives continuously to show that apparently inexplicable phenomena are actually comprehensible, whenever the method and the conclusions of the new philosophy are employed: "There is no phenomenon of nature which I have omitted to consider in this treatise."<sup>21</sup> Part IV of the *Principia* dwells on a series of phenomena that are prodigious or regarded as such, and that can easily be accommodated within a fully mechanistic explanation.

The same oscillation can be found in Letter CXCIX of July 30, 1640 to Mersenne, in which Descartes focuses on the subject of birthmarks, spots impressed on the fetus by the mother's imagination. Descartes offers a mechanistic, although somewhat elliptical explanation<sup>22</sup> which attempts to tie the topic into the curious description of an infant born with the same fracture of the arm that its mother had while pregnant.<sup>23</sup> The curiosity stems from the fact that the baby was supposedly healed by applying the same remedies that had been applied to the mother. In any case, the principles of his philosophy appear sufficient to explain this apparently prodigious phenomenon.

At stake is whether the mother's imagination is to be considered responsible for the malformations of her new-born child, in other words, for the production of monsters.<sup>24</sup> Descartes' hesitancy is obvious. Just at the point where the argument could take an interesting turn and sweep away all the absurd explanations of the old philosophy, he draws up short, right at the threshold. Monstrosity, only evoked, seems neglected or kept at a distance. Yet, in the same letter – this is how the tension manifests as a symptom – Descartes insists on the fact that the principles of his mechanism

specifically explain these apparently inexplicable phenomena much better than any other hypothesis. The "silk", for example, that grows on a girl's forehead, or the thorn that blooms on the body of a Spaniard – the prodigious cases mentioned by Mersenne – should perhaps be investigated more thoroughly. But in any case,

Concerning your statement that it is not possible to explain this phenomenon by referring to no other principle of life than heat, it seems to me on the contrary that this explanation served better than any other. For heat being a principle common to animals, plants and other bodies, it is not surprising that it serves to endow man and plant with life. In contrast, if there were a need for a principle of life in plants that was not of the same type as that which exists in animals, these could not be compatible.<sup>25</sup>

There are two moves played out in this passage. The exceptional and prodigious cases, the marginal and monstrous figures, are kept at a distance, away from the center of the system. At the same time, they are reintegrated, whenever possible and even at the cost of providing poorly structured explanations, in order for them to be neutralized and used to confirm the general principles of the system. Given the fact that these figures are anything but absent, it behooves us to explain their theoretical function.

The first thing to observe is that Descartes' writings are populated by a plethora of figures that are "marginal", hybrid, semi-pathological, borderline – in a word, monstrous. Not only do these sorts of tropes crowd the pages, their position and rhetorical function are anything but marginal. They abound, for example, in Letter CDLX of November 23, 1646 to William Cavendish, Marquis of Newcastle, his English friend with the "geometric mind."<sup>26</sup> Descartes returns to the theme of the primacy and uniqueness of "human" nature compared to animal nature. But no animal is capable of thought except for man. Although some of the beasts are stronger or better endowed than we are for certain functions, they still remain "animals" nonetheless. The only property that is typically and exclusively human is thought or reason.

But how can he demonstrate this clearly to his friend Cavendish? This is the challenge that gives rise to a series of monstrous and prodigious figures used to illustrate and validate Descartes' argument. Sleepwalkers, for example, accomplish prodigious feats, evidently without the use of reason.<sup>27</sup> An even stronger argument, says Descartes, is that only communication through words or signs unequivocally shows the humanity of the human animal. That we are talking about words and signs must be specified in order to include the "deaf and dumb" but exclude "parrots", which may certainly utter articulate sounds but cannot speak. And where in this taxonomy are "madmen" to be placed? In the human domain, of course, since they are clearly capable of speaking "à propos" of certain topics,

without however, being fully rational. Once again, the "deaf and dumb", although "imperfect" men, show their full humanity by inventing "special signs" to express their thoughts.<sup>28</sup>

Sleepwalkers, the deaf and dumb, madmen, beasts that speak or bury their dead... beings that are both marginal and marvelous throng onto the scene to confirm the rigid dualism that distinguishes and separates humanity from animality: no matter how perfect the most perfect of mammals may be, they will always be more similar to the most primitive and imperfect of inferior beings, like oysters or sponges, and therefore devoid of immortal soul. The use of borderline figures seems to be the best rhetorical strategy for Descartes. Standing at the limits and confines of this strict division, monstrosity could be understood as a synonym of ambivalence and interpreted as a sign of uncertainty. Instead, the intention is quite the opposite: to show that these figures in particular, which are located "at the limit", imply no ambiguity whatsoever; on the contrary, they confirm the rule. The theory is confirmed both at its center and its margins thanks to the theoretical contribution of these monstrous figures.

It is through the subject of blindness, however, that the heuristic power of a certain idea of monstrosity is fully revealed. The concept occupies a central place in the theory of knowledge, up to Locke's Sensism and the Enlightenment thought of Molyneux, Saunderson and Diderot. But it was Descartes who first exploited the rhetorical and theoretical depth of its potential. In his *Dioptrique*, as we know, the figure of the blind man serves to show how light is communicated in a straight line from the object to our eyes. More generally, it is used to describe the fully mechanical character of the "most universal and most noble" of the senses, namely, sight.

The evocative power, for example, of the famous image somewhere between a dream and a nightmare that suddenly emerges in the Second Meditation is extraordinary. We should not be surprised at the weakness of our mind reflected in our improper, but common use language when we say *video*. I see this wax, but what I really should say is "I judge" what I see to be wax; namely, colors, shapes, and nothing more. Similarly, when I look out of the window and say that I see human beings, "Yet do I see any more than hats and coats which could conceal automatons?"<sup>29</sup> What do these simulacra of truth – more properly "monsters" of the perception than of the imagination – come to disturb?

What betrays us, then, is our judgement. There is nothing anomalous in the "imagination", i.e., in the mental representation of "images" which are neither true nor false per se. This is also why the chimera – yet another archetype of monstrosity – insinuates itself surreptitiously between man and heaven, or between angels and God.<sup>30</sup> But because what is being put into question is the judgement, the image itself is neutralized: "whether it is a goat or a chimera that I am imagining, it is just as true that I imagine the

former as the latter."<sup>31</sup> Reason will thus be given the task of intervening to discipline the chimera, to restore order to the reasoning, as it were.

The same process takes place with regard to the memory, which is similar to the imagination in this respect. The perception is no longer what deceives the mind; in other words, the external reality – or its deceptive perspective – is not the only thing that creates false images. Chimeras are also produced by the memory, a mirror of internal images that, as such, do not come from the outside. In this instance, the monstrous imagination threatens the clarity of the system from within. It is not the perception that is deceptive, but the mind itself, through one of its most important faculties.<sup>32</sup> Chimeras and hippogryphs still lurk, so to speak, ready to awaken in the sleep of reason whenever it is distracted or absent.

Metaphors aside, Descartes is well aware of the danger represented by dreaming. The radical difficulty that arises from reflecting on the epistemological and ontological foundations of the real has soporific or even narcotic-like effects.<sup>33</sup> What is required, then, is a choice of the will: the choice to resist the sleep of reason so as to go deeper and reinforce it, like a dam holding back the monstrous fluidity of the real. Even the most imaginative of mental images must be anchored in reality. Even the most chimeric productions of the imagination must be "tamed" and brought back to some essential relationship with reality, no matter how minimal. This is suggested, once again, by reason; the need to avoid skepticism of the most damaging kind also demands it.

If dreaming is what we must talk about, then Descartes will attempt to plant the banner of solid rationality at the heart of its territory. Although faint, it will act as a light in the darkness that threatens our knowledge from having any pretense of objectivity. Monstrosity serves once again as a hinge-pin for this delicate epistemological operation. It is explicitly alluded to, only to be immediately tamed by the rational process.

There is nothing more dangerous, and at the same time more necessary, than thinking about reality as a dream. It is precisely when we are dreaming that we experience the inability to distinguish between a truth and a falsehood. But it is also at the heart of this terrifying idea that we find a foothold for escaping from this threatening mix of the oneiric and the real. Even in dreams, says Descartes in the First Meditation, things are represented like images painted on canvas (*veluti pictas imagines*).<sup>34</sup> And, like images on a canvas, they must necessarily be minimally related to a reality that is ontologically prior and higher:

For even when painters try to create sirens and satyrs with the most extraordinary bodies, they cannot give them natures which are new in all respects; they simply jumble up the limbs of different animals. Or if perhaps they manage to think up something so new that nothing remotely similar has ever been seen before –

something which is therefore completely fictitious and unreal – at least the colours used in the composition must be real.<sup>35</sup>

Dream images are thus brought up as a threat, in the nightmarish possibility of an evaporation of the borders between reality and dreams. Immediately afterwards, however, they are subordinated and pegged once again to a minimal, albeit tenuous, principle of truth, a common denominator with reality: *ad minimum veri colores esse debent*. The jumble and composition of members belonging to different animals, certainly reminiscent of Horace's chimera, the true archetype of monstrosity,<sup>36</sup> is not even the most threatening monster. Descartes pushes the idea of monstrosity even further, beyond the boundaries of what the Latin poet feared and condemned: more terrifying still is the idea of a monster that does not resemble anything, one that has no relationship whatsoever to any known thing (*nihil omnino ei similis fuerit visum*).

Interestingly enough, Descartes does not discuss geometric figures, or even simply curved and straight lines, in order to establish a common basis to any possible image. Rather than geometry, what unites all the existent or conceivable images is color. Colors are chronologically and ontologically prior to forms. In this respect, Descartes is aligning himself with an ancient tradition going back at least to Empedocles, according to which forms are attained by means of colors.<sup>37</sup> Painting imitates forms, but they are secondary to colors. If this conception strikes us as particularly significant in the Greek tradition,<sup>38</sup> its appearance is even more astonishing in the work of Descartes whose effort to geometrize the world was unprecedented. The reason, however, is to be found precisely in the need to radicalize the concept of monstrosity, to free it from any resemblance to forms pre-existing in the human mind. The metaphor of colors once again serves to posit a type of monstrosity that resembles nothing else, and which makes headway down the dangerous route of making itself independent from the rule that claims dominate it.

This is where Descartes erects his barricade, at the same time reeling in this extreme figure of monstrosity: no matter how remote from all the rest, from any other known image, this new and terrible chimera will at least be composed of "true" colors. This is the minimum core of truth, providing a foothold to climb out of the abyss of dreams and up to the surface of clear, rational thinking.<sup>39</sup> Some minimal reality forms the substrate of all images, *seu veræ, seu falsæ*, and of all beings, no matter how fanciful they may be. Monstrosity is thus "chained" to a core of the real that serves as a basis for correct reasoning. This core of the real is necessary and sufficient to turn the deception we experience from our perception into the safety we gain from our reasoning. In order to arrive at this conclusion, however, the monstrous had to be summoned and awakened, only to be immediately tamed and circumscribed within a safe, reliable domain.

## Rational Law Inside Me, and Universal Normativity Above Me

This fundamentally important point cannot be overly stressed: monstrosity, in the peculiar forms it assumes in Descartes, is not marginal; rather, it plays a central role in the construction of the system. Descartes is at the same time "driven" to make use of monstrosity and "forced" to allude to it, only to immediately attempt to tame it. He is forced to do so because monstrosity and anomaly must necessarily be contended with by every philosophical system intending to construct an eternal and necessary natural order.

The tension between the chimeras of the imagination, dreams, and false perception on the one hand, and the core of the real to which they are ontologically subordinate on the other, creates a guaranteed escape from the prison of skepticism and uncertainty. But if the tension between these two poles is the central element, it is because the rhetorical and heuristic route that Descartes takes is, from the outset, necessarily dualistic. Radical evil, the abyss of doubt, monstrosity and the chimera of false reasoning must be called upon from the outset in order to free oneself of them as soon as possible. They must be affirmed, as a monstrous hypothesis, in order for them to be immediately refuted. The real, the true, and the normal are necessarily placed in tension with the imagined, the false, and the monstrous. They are not ontologically prior, but they become so, in and through the rhetorical strategy of Cartesian thought.

One of the passages where this successfully productive tension is most obvious is the dazzling beginning of the Third Meditation: "I will now shut my eyes, stop my ears, and withdraw all my senses..."<sup>40</sup> This is a centripetal movement. I need first of all to defend my position and gather around the central core of the self, around thought that is as pure and remote as possible from reality. But then I must leave this central core, moving toward the external, which is still uncertain and yet to be demonstrated, toward "the earth, sky, stars, and everything else that I apprehended with the senses." This time the movement is centrifugal, creating uncertainty. I am of course sure that I possess the ideas of the objects in my mind, but who can assure me as to their external existence? We must turn around and go back once again, returning to our own mind, focusing on elements which appear to be simpler, such as geometric objects. When I think of "2" and "3" as objects which, when added together, make "5", do I not perhaps understand them clearly enough to be able to say that they exist beyond any doubt?<sup>41</sup>

This seemingly unassailable certainty had to be conquered by force and justified. For Descartes, reason is not the "measure" by which to calibrate one's certainties. At least, not before it, too, is "measured", justified, and established. The result of the rational inquiry is not in danger, but the possibility of "really" carrying out that inquiry outside of illusion and

deception is. The subjective will to engage oneself in the inquiry takes on a decidedly central role. And the effort Descartes puts into establishing the foundation becomes a truly colossal undertaking. The subject is not strong inasmuch as he or she is originally endowed with reason, since reason is precisely what is being put to the test here. On the contrary, reason becomes strong to the degree the subject is able to assert it, in exposing himself or herself to the absolute, monstrous risk that he or she does not exist. The force of reason has no other strength, we might say, than its force.

To accomplish this feat, Descartes does not hesitate to call on radical evil, through the hypotheses of the evil genius and the deceiver God. At this point we arrive at the heart of Cartesian theodicy, a topic that has received a great deal of scholarly attention.<sup>42</sup> It is important, however, to at least recall that these two figures of radical evil are distinct and perform different functions in the Cartesian rhetoric. They represent two different types of monstrosities that Descartes summons and brings together so as to confront them and defeat them in the duel with reason.<sup>43</sup>

The evil genius "invention" performs its function entirely in the sphere of nature. Without doubt a figure of radical evil, it is in itself a monster, since it is capable of producing the radical monstrosity of absolute deception *ex hypothesi*. It is a monstrosity, however, that "only" affects the sphere of the objective existence of reality, its relationship with the knowing subject, and the limits of perception and knowledge. One responds to this monstrosity by stripping oneself down and by amputating all one's potentially illusory features. In other words, one responds by becoming – even if only for a moment – the monster that the evil genius would like to condemn us to being: "I shall consider myself as not having hands or eyes, or flesh, or blood or senses, but as falsely believing that I have all these things."<sup>44</sup>

In the act of deceiving myself, or making myself a blind, mutilated, intangible monster, even if only by way of hypothesis, this evil genius at the same time offers me the minimal core of truth I need to doubt him, at least as much as he leads me to doubt myself. At least in the sense that when "he" acts on "me," when we are on the same plane, I will no longer be forced to acknowledge or grant him, even by way of hypothesis, more reality than I grant to myself. "As much as" he deceives me, "all the more" he irrefutably and indirectly demonstrates my existence to me.<sup>45</sup> The more monstrous this hypothesis is, the more monstrous is the genius who gives rise to it, and the more clear and obvious is the avenue to follow in order to neutralize and "normalize" it.

The deceiver God, on the other hand, is not limited to this fictional device: for Descartes it is a metaphysical "hypothesis." What is at stake here is no longer limited to the external reality, the dimension we might define as the "horizontal" one between the knowing subject and the object of knowledge. What is at stake and called into doubt again is the "vertical" and

ontological dimension upon which the entire metaphysics and the very possibility of reason are founded. In His absolute freedom, the deceiver God assails evident and even mathematical truths. Even the principle of non-contradiction teeters under the blows of this monster, who can see to it that 2 plus 3 does *not* equal 5.

Tullio Gregory, in an article that has not received the attention it merits, has tried to go beyond the view now widely accepted in the literature on the difference between the evil genius and the deceiver God.<sup>46</sup> He has reconstructed the philosophical bases of theodicy in the context of the late-medieval debate, going back in particular to the Occamism of Gregory of Rimini and Gabriel Biel. The *Deus qui potest omnia* of the Occamists, says Tullio Gregory, is not solely a metaphysical hypothesis that gets added to the "physical" one of the evil genius. The omnipotent *and* deceiver God is the reflection of very concrete concerns that existed and traversed the culture of the Cartesian age; this makes it interesting to revisit the Occamist elements of theodicy in a very different context than the late Medieval period in which Gregory of Rimini and Gabriel Biel wrote.

Extending the interpretation of Tullio Gregory, I would argue that the evil genius and the deceiver God embody the monstrosity and challenge of a potential violation – one that is absolute and radical – to the new principle of universal normativity established by Descartes. If we accept the idea that there is a difference between the two figures, the evil genius can be said to demolish the order established by the universal normativity, described by science and concretely experienced by human beings in their daily lives. The deceiver God, for its part, goes even deeper, undermining the foundations of a possible normativity or of *any* possible normativity. How could I ever found a rational law inside me, without being able to affirm a universal normativity above me?

The monstrosities of which I speak thus take on the semblance of a two-headed monster, a Janus figure whose two heads or faces perform different theoretical functions, but which converge in their attack on the possible foundations of certainty. The physical and metaphysical planes converge for Descartes in this foundational teratotomy. From this perspective, I can say that the reinterpretation of theodicy at the dawn of the new era casts a new light on the whole problem. Once we acknowledge the more fundamental character of the threat that the deceiver God represents compared to that of the evil genius, it seems fair to say that Descartes shifts the problem to the construction of a subject capable of resisting it. This subject deploys his own will as a final barricade against both physical and metaphysical monstrosity.

The dichotomy between the self and the world is profound. It is the rupture between a world that may not be real and a "self" that must be real, in so far as it places itself in front of this world. However, it is precisely the space of this dichotomy that enables the foundation of an impregnable core

of the real, at least in the eyes of Descartes. That is why the false or the monstrous must be summoned from the outset. Summoned, that is, into the heart of the foundational and absurd hypothesis (if not *ab absurdo*) of the evil genius on the physical plane, and the deceiver God on the metaphysical.

That is why monstrosity must also necessarily be radical. The foundations of the whole system are to be laid on its ruins. The way out of skepticism is only possible through the space of this dichotomy, namely, in the radical separation between a twofold dimension: mine, about which I know nothing and can say nothing with certainty; and another one that I imagine as being as deceptive and monstrous as possible. But, at the exact instant I do so, our mutual difference is actually confirmed by the space and the tension between the two dimensions. The monstrous "Other", false and deceptive by definition, actually confirms my existence and my normal identity as real and not deceptive. This dualism is necessary, once again, *ab origine*.

### From *Thauma* to Knowledge: The Good Use of the Passions

Monstrosity also produces theoretical effects of remarkable intensity in the sphere of the passions. Admiration, we might say, is the mother of all superstition. This might be one of the main conclusions arrived at by many of the philosophers committed to the construction of a new mechanistic image of the world versus the old philosophical conceptions, still imbued with hidden qualities, mysterious tendencies, and intentional species. Descartes states this repeatedly in his writings.

The divine character and the mysterious nature of monstrosity began to change in the period between the 16th and 17th centuries, thanks to the revolutionary impetus of Cartesian ideas and his rejection of *admiration*. *Le monde, L'homme* and especially the *Discours* are fundamental stages for the entire philosophical and scientific thought of Western civilization. However, without completely calling into question the Cartesian condemnation of admiration, we must analyze more fully the role it plays in his overall system of knowledge. His was not a condemnation pure and simple. In the *Passions of the Soul* in particular, *admiratio* has a very complex function, and it would be difficult to regard it exclusively as the opening to all types of superstition and ignorance.

The beginning of *Meteors* directly tackles the question of *admiratio*. We naturally admire things that are above us, such as celestial phenomena or the clouds. Although they are only a little higher than the mountains, for example, painters and poets depict them as the throne of God.<sup>47</sup> The deliberate ambiguity of Descartes and the double meaning of "things that are above us," to indicate both atmospheric and "superior" phenomena, in the sense of heavenly and divine, can hardly escape our notice. His

programmatic intent immediately becomes clearer: to break the mechanism of admiration which ties incomprehension and ignorance, firstly, to physical causes, especially about atmospheric phenomena, and secondly, to superstition and the image of a God sitting on top of the clouds who "uses his own hands to open and close the gates of the winds, to water the flowers and hurl lightning at the rocks."

His objective is immediately revealed: "If I explain here the nature of celestial phenomena, so that no longer will you *admire* what it gives cause to, in the same way will you consider it possible to discover the causes of all that is most *admirable* on the earth."<sup>48</sup> At the end of the text, Descartes adds: "I hope that those who have understood everything spoken of in this treatise in the future will not see anything in the clouds whose causes cannot be easily understood or that would be cause for admiration."<sup>49</sup>

This essay, therefore, which addresses itself to many phenomena traditionally considered "prodigious", like rainbows, the mother of *thauma* for the ancients, is primarily written to argue against admiration. We thus find ourselves in the very same domain where monsters and prodigies are traditionally catalogued. Descartes is attempting to use the new conceptual tools of mechanism in order to escape from the late-Renaissance mentality that still grouped all these phenomena into the same category which – albeit with different variations and nuances – provoked the same feeling of admiration and wonder.

In this sense, admiration leads to superstition. Monstrosity is at work indirectly in this case. *Admiratio* is the affect we normally feel toward incomprehensible and inexplicable phenomena, but especially toward things that are prodigious and monstrous. However, as Daston and Park have shown,<sup>50</sup> it also has a more complex and fundamental role in the overall dynamics of the passions and, ultimately, in the relation they have with the intellect and knowledge. To grasp what this role is, let us turn our attention to *The Passions of the Soul*.

After speaking "in general", Part II of *The Passions* goes into detail about their number and order, beginning with the six primitive passions and how they function. Admiration – the subject of the polemical *Le monde, L'homme* and the *Discourses* – now becomes none other than "the first of all the passions."<sup>51</sup> This is not a reversal of position, but rather the need for deeper examination of this "primary" passion, placed at the center of the relationship between the emotional sphere and the intellectual sphere. Admiration, we read, arises when we encounter any object that is surprising to us because of its novelty or because it differs from what we thought or believed it should be. It arises, therefore, either out of total ignorance of what lies before us, or from the difference between the thing as it really is and how we imagined it was supposed to be. It is important to note, moreover, that admiration arises at once, before we know whether the

admired object is convenient or not with our nature. This takes place before the movement of the passions leans toward the "favorable" or the "unfavorable", along the crest, for example, of esteem and love, or in the opposite direction, toward contempt and hatred.

After a short list of some of the more common passions, Descartes presents a detailed analysis of admiration, in Articles 70 to 78. No other passion receives so much attention or plays such a critical role in initiating the mechanical process of knowledge. Given its status, the passion of admiration can be viewed as a "mirror", reflecting back to us not only Descartes' programmatic statements, but also the strong importance that the rare, the prodigious, the marvelous, and the monstrous hold in his system, summoned only to be tamed and led back under the dominion of reason. The ambiguity is explicit, and the balance in which the passion of admiration must be kept, between excess and lack, is a strong indicator that we have arrived at one of the fundamental kernels of Cartesian philosophy.

The primitive passions, then, are love, hate, desire, joy, sadness, and, of course, admiration. It is defined as a "sudden surprise" of the mind that causes it to regard objects that appear to be "unusual and most strange" with concentrated attention.<sup>52</sup> The monstrous clearly falls into this category. There are two stages to the process. First, the object assumes a certain "worthiness" for the mind – because of its rarity or prodigiousness or monstrosity. This gives rise to a movement of the spirits that reverberates both in the brain, "to strengthen and preserve" the impression of the object in one of its parts, as well as in the body, to keep the sense organs "fixed" on the situation that set the process into motion.

Although this passion does not involve any change in the heart or blood, the force of its impact is enormous "because of the element of surprise, i.e. the sudden and unexpected arrival of the impression which changes the movement of the spirits."<sup>53</sup> Surprise is thus the defining property of admiration. Its power lies in the fact that it is at its strongest when it first appears. After striking with all its potential, it can only subside, but it can never grow slowly and gradually. Similarly to how the soles of our feet are unaccustomed and, therefore, vulnerable to a delicate movement that causes a tickling sensation, yet they can walk on a rough surface and support the weight of the body without any problem, in the same way, the mind can easily handle what it is ordinarily accustomed to, but when faced with anything rare and out of the ordinary it becomes vulnerable to admiration.

This process may cause adverse effects, since the surprise may be so strong that "the whole body remains as immobile as a statue, making it possible for only the side of the object originally presented to be perceived, and hence impossible for a more detailed knowledge of the object to be acquired." Astonishment is therefore a harmful "excess" of admiration, and

"it can never be other than bad."<sup>54</sup> But this is exactly where the ambiguity lies. If astonishment is always bad, the admiration from which it originates is presented instead as necessary to acquiring knowledge in Descartes' view. The usefulness or "good use" of the passions in general consists in ensuring that the thoughts in the mind that need to be preserved are strengthened and retained before they flow away, erased by other thoughts. The passions act as a catalyst or stabilizer of thoughts.

Although excessive admiration may cause harm, then, by fixing the mind in "wonder", it is necessary to stimulate knowledge; also, wherever admiration is lacking, ignorance prevails.<sup>55</sup> It is true that the greatest risk comes from admiring too much rather than too little, but the fact remains that an inclination toward admiration "makes us disposed to acquire scientific knowledge." This process must necessarily be subordinate to the intellect and reason. However, in his analysis of admiration, Descartes seems to have opened the door to something new with respect to his programmatic statements about an exclusive interest in the general, universal, ordinary and normal. This is supported by what he describes as the only possible antidote to an excessive *imperium* of admiration:

There is no remedy for excessive wonder except to acquire the knowledge of many things and to practise examining all those which may seem *most unusual and strange* [my italics].<sup>56</sup>

What becomes necessary is practise with the rare and extraordinary, in other words, interest in what may appear prodigious or monstrous – at least until the intellect and reason intervene.<sup>57</sup> We could try to express this suggestion of Descartes in more "modern" terms by saying that "curiosity is the mother of invention." But in my view this would neutralize the most interesting aspect to emerge from this long analysis of admiration. Curiosity must be directed, at least initially, toward that which appears unusual and strange. The difference thus stems from the motivation behind the affect. The rare, the singular or the monstrous must be taken as a means, and not as an end. Good *curiositas* is what inclines admiration toward the side of knowledge rather than wonder.<sup>58</sup>

Now, the ambiguity and the fundamental importance of this passion, caused by rare, prodigious or monstrous objects and events, is that this impression on the brain and this "block" to the attention, both mental and corporeal, is both necessary to knowledge, but also potentially damaging if it lasts too long or is not properly quelled by reason. This "disturbing" presence of the monstrous inside a system whose aim is to neutralize its deleterious effects and the potentially "bad" admiration it may cause, is at the heart of the only passage in which Descartes mentions physical monstrosities, which we will look at closely in the following section.

## The Monster: Degree Zero of Normality?

Descartes explicitly discusses the issue of physical-anatomical monstrosities in *Cogitationes circa generationem animalium*. The dating of this text is uncertain, but according to Charles Adam, the topic begins to head the list of Descartes' interests at least as early as the late 1620s.<sup>59</sup> Like all Cartesian treatments of the formation of life, this text does not have much breadth to it. Descartes remains unclear on many points and he passes too quickly over issues that will present the greatest challenges to scientists more directly involved in this field of research during the same period. Their discoveries soon put into question the entirely mechanistic explanations on the formation of the fetus that Descartes had advanced.

The text on monsters, then, is only a short fragment, contained in a text whose original composition is uncertain and whose influence is limited in years. However, because of its location, form, and content, it takes on special significance in reconstructing the importance and role of the concept of monstrosity in Cartesian philosophy. As I will show, this passage reveals a tension with other fundamentally important parts of Descartes' work, especially 1) on the importance and existence of final causes and 2) on the theory of continuous creation.<sup>60</sup>

The *Cogitationes circa generationem animalium* develop a strictly mechanistic theory on the formation of the fetus guided by the ideal of a "mathematical embryology".<sup>61</sup> There is no digression and no rhetorical artifice: for some pages Descartes proceeds in a linear fashion to describe the formation of the organs and, specifically, how the sex is determined. Suddenly, with no warning whatsoever, we come to a passage that leaves the immediate field of epigenesis and a purely physical, mechanical problem to pose a "rhetorical" question that clearly shifts the focus to metaphysics:

Someone will say with disdain that it is absurd to attribute a phenomenon as important as the formation of man to such small causes; but what greater cause than the eternal laws of nature is required? Does one want the immediate intervention of some form of intelligence? If so, what intelligence? God himself? Why then are monsters born? Would one want to see in such things the operation of that wise goddess of nature that owes its origin to nothing other than the folly of the human mind?<sup>62</sup>

Immediately afterwards, the discussion is picked up again where it was broken off, continuing to explain the movement of blood. The reader is brought back to the physical, after being made aware of the metaphysical implications of the issues in question. I believe this digression is fundamentally important. Monstrosity is mentioned explicitly, and with a force that is unprecedented in the rest of his work.

What is Descartes' intention, then, behind this apparently dazzling passage in a text which, as a whole, does not aspire to a particularly significant impact? Monstrosity is "played" through a fully mechanistic reading against the other, opposing "monstrosity" which was in the opinions of Galen and his followers on final causes. For these followers of the Galenist school, the formation of man could certainly not be confined within such a simplistic explanation, nor could it be attributed to causes of such minor importance as exclusively mechanical ones. But these *levibus causis* were precisely the first step in challenging the anthropocentric theory that had given rise to so many misunderstandings and falsehoods. Although there were no doubts as to the "pre-eminence" of man, the human mind, and human reason over the other animals, even Descartes was always careful to blame the absurd anthropocentric prejudice which led to an incomprehension of nature and which could result, paradoxically, in attributing greater importance to this world than to the beyond.<sup>63</sup>

Once the anthropocentric prejudice is weakened, man must be readmitted into nature, in his proper place, context, and with the proper role. At stake, then, are the controversies of both anthropocentrism and final causes, within which Descartes inserts the reference to the theme of monstrosity. The canonical position of Descartes, as we know, is to deny that the study of final causes has any utility whatsoever for physics or understanding nature. This argument is developed especially effectively in the Fourth Meditation,<sup>64</sup> as well as in the *Principia* I, 28.<sup>65</sup> At the same time, there is no doubt that final causes exist, over and above the limited capacity of human understanding. They exist in the mind of God, who has freely created them, as He has created us unable to grasp all His "conseils."

Admiration resurfaces in this context, accompanied now by indignation, a form of envy that is not a vice.<sup>66</sup> Indignation is a complex passion giving rise to both "the laughter of Democritus and the tears of Heraclitus." The way it works is of interest for understanding the role of monstrosity. People believe things should happen or present themselves in a certain way. When this fails to occur, the surprise causes a mixture of indignation and admiration to well up that is typical of people who want more to appear virtuous than be virtuous. There is an ethical side to this argument, then, that is inseparable from the epistemological aspect. Indeed, "it is impertinent and absurd not to confine one's indignation to the actions of human beings and to extend it to the works of God and nature."<sup>67</sup>

Human beings have expectations and are ignorant. When disorder, chaos, and monstrosity appear unexpectedly, they provoke indignation and blame in us that may possibly be extended to nature and God. The argument of the Fourth Meditation is thus confirmed and Descartes has come full circle. Overall, this is a point of fundamental importance in the development of Cartesianism. It will leave dissatisfied both the supporters of final causes like Gassendi,<sup>68</sup> and the rigid opponents of finalism like Spinoza.<sup>69</sup> But above

all, it will leave the door open to a plethora of different positions, which can somehow be collected under the broad umbrella of Cartesianism, but which vary widely on the issue of how much room to grant to finalism. In my opinion, these vacillations in 17th-century Cartesianism were caused by an essential ambiguity in Descartes' text. This is not a contradiction, but rather an opening that makes a series of positions, even divergent ones, possible.

The reference to monsters, in that key passage in the *Cogitationes*, can be considered a basic declaration, a sort of a "minimal" kernel essential to any mechanistic stance. However, it is in tension with some of Descartes' most important ideas, such as that of continuous creation, and the existence of final causes, no matter how unknowable and useless they are for the study of physics. The human intellect is limited, and it is therefore impossible to understand everything that God has created, and continues to create in the universe. Rather than be indignant, therefore, about what we do not understand, we would do better to apply ourselves to our studies and investigate what is within our capabilities.

The incapacity of the human intellect to embrace all of God's works is a recurrent theme in Christian thought at least since Augustine. Augustine is also a crucial thinker for Descartes on the issue of monstrosity. The Augustinian position was that in no way can monsters be seen as imperfections. Only the ignorant define what they fail to understand as disorder and imperfection. The human mind is too limited to grasp the entire divine design, which we must posit unhesitatingly as absolutely perfect. That is why the problem of theodicy, ultimately, is unfounded for Augustine. This is not a matter of justifying God for any evil that exists in the world, because, in this sense, there is no such thing as evil or imperfection or monstrosity.

Thinking about the imperfections and monstrosities of nature, I believe we can say that Descartes integrates the Augustinian attitude into his philosophy to a considerable degree, at least in his major works. The Fourth Meditation is especially significant, once again, in these terms. Not only does it contain the theme of our intellect being inadequate to embrace all the mysteries of creation, but, following Augustine, Descartes also argues for the need to consider what we do not understand – including imperfections and ourselves, in that we are "monstrously" inclined to error – in the overall context of the universe. From this perspective, chaos, imperfection, and monstrosity appear in a very different light, reabsorbed into the entire divine creation as a whole:

It also occurs to me that whenever we are inquiring whether the works of God are perfect, we ought to look at the whole universe, not just at one created thing on its own. For what would perhaps rightly appear very imperfect if it existed on its own is quite perfect when its function as a part of the universe is considered.<sup>70</sup>

Imperfection, therefore – and, by extension, monstrosity – is a concept that has meaning only by isolating the object or phenomenon in question. But when it is considered "*in mundo rationem partis*", the variety of things will appear as an overall perfection.

This argument tends to develop an Augustinian type of attitude, placing the emphasis on the limits and the defects of our understanding rather than on the perfection of the things "in themselves". This is an explanation that could be defined as both ethical and esthetic, in the sense that what appears to us as chaotic, monstrous and reprehensible, is not, in fact, when seen from a different, broader perspective, a perspective in which what is good and right is also beautiful. However, this explanation appears to be in tension with other passages in which Descartes seeks to establish his answers based on more strictly mechanical arguments, developing his arguments on a rigorously physical, mathematical basis, rather than on ethical or esthetic grounds.

This tension is evident, for example, in the *Replies to the Objections* collected by Mersenne on the Second Meditation. The issue is still imperfection, which clearly points to the responsibility of God in creating monstrosity. A reply must be made, insists Mersenne, to the atheist for whom the existence of an infinitely good God – the absolute Being – would exclude the existence of any other thing, especially non-Being, evil and imperfections. The profoundly ethical slant of Mersenne's question cannot be overlooked. We might translate and summarize it as follows: *Si deus est, unde monstra?*<sup>71</sup>

Descartes, however, here as elsewhere, tends to shift the issue out of ethics onto a physical-mathematical plane. It is not a matter of responding to Mersenne's atheist on the existence of good and evil, so much as on his "bad" idea of the infinite. The infinite is certainly not what excludes the existence of finite things. In the first place, then, the atheist commits a logical error, since the infinite creative potential of God hardly implies the impossibility of creating any finite thing. The opposite is true: God can create anything He wants, and the existence of the finite in no way stands in contradiction to the infinite.<sup>72</sup>

This tension also emerges between the more rigidly mechanistic explanation of monstrosity, provided especially in the *Cogitationes*, and the idea of continuous creation, which is vital for the whole Cartesian system. Already in *Le monde*, nature is defined as matter itself, with its own qualities, inasmuch as it is continuously preserved by God.<sup>73</sup> The passage is particularly consistent with the explanation in the *Cogitationes* because, once again, for Descartes, it is a matter of forcefully asserting that "by 'nature' here I do not mean some goddess or an other sort of imaginary power."<sup>74</sup>

In nature, maintains Descartes, changes may only be improperly attributed to God, in that His action is immutable. And the rules according

to which these changes occur are precisely the "laws" of nature. God, therefore, continuously creates and preserves matter, which necessarily changes within and in accordance with such laws.<sup>75</sup> However, the problem of disorder, imperfection, and monstrosity in nature remains to be resolved. If God continuously creates and preserves matter, where do monstrosities come from? Descartes now attempts to regroup "irregularities" back under the difference between rectilinear and curved motions, distancing himself once again from the position we have defined in very general terms as Augustinian, which views imperfections as depending solely on our ignorance.<sup>76</sup>

In the mind of Descartes, once again, the physical, metaphysical and ethical spheres all refer to each other. It is extremely important to note, however, that the explanation tends to vacillate again in a very different direction: there is no reference here to the deceptive imagination of imperfections due to our ignorance. What we have now is the genuine "resistance" of matter, in its actual existence, to the rectilinear movement originally created by God. In the same way, in the actual existence of human will, there is resistance to the good movement originally impressed in us by God.

As an interpretation of the imperfections of nature and monstrosity, this explanation draws more heavily on Aristotle and the resistance of matter to form than on Augustine and the limitations of the intellect.<sup>77</sup> But this would be overreaching our interpretation. Nevertheless, a clear tension remains implicit in the various explanations that Descartes provides of both ethical and physical imperfections in nature as well as under the general category of divine laws.

In his comments on Gueroult, Canguilhem suggested that there is an obscure point in the relationship between Cartesian biology and metaphysics. Only the hypothesis of the Creator-God would allow, on the one hand, for the subject to be understood as a substantial union between body and soul and, on the other, for the rigid distinction between fully human life and animal and mechanical life. For Canguilhem, this tension suggests the need to reflect on the "statistical" point of view and probability in biology (all biology, both human and animal). The point of view of the "totality", introduced by Descartes to rigidly separate human life and animal life leads to a dead end. In subsequent decades, the philosophy of biology began to question the ontological primacy of the human body, qua human, in order to gain access to a different set of issues, namely, regarding "fluctuations", "errors", successful and unsuccessful attempts.<sup>78</sup> Although Canguilhem does not address the issue of monstrosity in these pages on Descartes,<sup>79</sup> I hope to have shown in this article that the problem of monstrosity is precisely what allows the most interesting tensions in Cartesian philosophy to be brought into view.

## Conclusion

In Part III of the *Principles*, Descartes begins his examination of the "visible world". On the basis of the principles laid down in the first two parts, the task is now to understand all natural phenomena perceived through the senses. He begins by following the methodological procedure already described, by starting from the most general things on which all others depend. As soon as the scientific undertaking is about to begin, admiration makes its entry once again. We must start "par l'admirable structure de ce monde visible."<sup>80</sup> The power and the goodness of God are infinite, while our intellect is very limited. Therefore, maintains Descartes, we can never go wrong by imagining the works of God as too perfect, but we would certainly go wrong by imagining it instead as having some lack or limit. The danger does not lie in overestimating creation, but in underestimating the infinite power of the Creator because of our failure to understand the created world.

On the one hand, then, the Cartesian enterprise of reducing nature to a set of universal, physical-mathematical principles that embrace all phenomena has already begun. On the other, however, Descartes is fully aware of the implications, and the theoretical and theological dangers, of the problem of monstrosity, ones which will cause much ink to be spilled in Cartesian circles over the ensuing decades. He is aware of the threat that hangs over the whole system,<sup>81</sup> as well as the potential that lies in the possibility of taming and neutralizing monstrosity, by using the questions it engenders to his own advantage.

Out of this, as I hope to have demonstrated, comes the successfully productive tension that arises between texts that tend to present the world as surpassing the human intellect, stressing our finitude with respect to infinite, incomprehensible divine nature; and texts that tend toward explanations that are perhaps simpler, more limited and dissatisfying, but which break more forcefully with the old philosophy. The scientific longevity of these texts may be shorter and their influence more restricted. From this tension, however, comes a complex image and powerful theoretical function of monstrosity which tends to be masked by a one-sided reading of Descartes' work. Even though he lacked the intellectual and scientific tools to definitively put to rest the issue of monstrosity, Descartes fully grasped its importance and weight. In so doing, he left the door open for his followers to pursue one of the most interesting and fruitful problems of modern philosophy.

<sup>1</sup> References to Descartes employ the following abbreviations:

AT: René Descartes, *Œuvres de Descartes*, ed. by Charles Adam and Paul tannery, 12 vols. (Paris: J. Vrin, 1964-74).

CSM: René Descartes, *The Philosophical Writings of Descartes*, trans. John Cottingham, Robert Stoothof, and Dugald Murdoch, 2 vols. (Cambridge: Cambridge University Press, 1985).

CSMK: René Descartes, *The Philosophical Writings of Descartes*, trans. John Cottingham et alii, vol. 3, *The Correspondence* (Cambridge: Cambridge University Press, 1991).

<sup>2</sup> In addition to the classic study by Lorraine Daston and Katharine Park, *Wonders and the Order of Nature, 1150-1750* (New York: Zone Books, 1998), see Zakiya Hanafi, "Medicine and the Mechanized Body," *The Monster in the Machine: Magic, Medicine and the Marvelous in the Time of the Scientific Revolution* (Durham and London: Duke University Press, 2000) on the relationship between monstrosity and the mechanistic world view, with reference to Descartes.

<sup>3</sup> For more on Cartesian physiology, see Pierre Mesnard, "L'esprit de la physiologie Cartésienne," *Archives de Philosophie* 13 (1937): 181-220; Anne Bitbol-Hespériès, "Cartesian physiology," in *Descartes' Natural Philosophy*, ed. by Stephen Gaukroger, John Schuster and John Sutton (London and New York: Routledge, 2000), 349-382; .

<sup>4</sup> See Mesnard, "L'esprit de la physiologie Cartésienne," 182.

<sup>5</sup> See George Canguilhem, "Organisme et modèle mécaniques. Réflexions sur la biologie cartésienne," *Revue Philosophique de la France et de l'étranger* 80 (1955): 281-299 and Martial Gueroult, *Descartes selon l'ordre des raisons* (Paris: Aubier, 1953).

<sup>6</sup> See Sergio Landucci, "Per la storia della teodicea nell'età cartesiana," *Rivista critica di storia della filosofia* 36 (1981): 401-437.

<sup>7</sup> This cannot be done as a "premise" to seventeenth-century philosophy. Far more interesting, to my mind, is the way the conceptual spheres in which these notions gravitate are linked discursively and develop out of extremely fluid confines. C.P. Ragland, "Descartes's Theodicy," *Religious Studies* 43 (2007): 125-144, for example, discusses *error* as "an epistemological version of the problem of evil." Similarly, we could discuss *evil* as "an ethical version of the problem of monstrosity", or *monstrosity* as a "physical (and also metaphysical) version of the problem of evil." Rather than positing a definition from the outset, I believe it can be derived from a historical study of the philosophical ideas of this complex period straddling the crisis in the Renaissance conception of the world and the rise of the mechanical world view. For more on these problems of definition, see Bernard Tocanne, *L'idée de nature en France dans la seconde moitié du XVII<sup>e</sup> siècle. Contribution à l'histoire de la pensée classique* (Paris: Klincksieck, 1978). More specifically on monstrosity, see Jean Ceard, *La nature et les prodiges. L'insolite au XVI<sup>e</sup> siècle* (Genève: Droz, 1996).

<sup>8</sup> See Jorge Secada, *Cartesian metaphysics: The Scholastic Origins of Modern Philosophy* (Cambridge: Cambridge University Press, 2000).

<sup>9</sup> See Daniel Garber, *Descartes Embodied: Reading Cartesian Philosophy through Cartesian Science* (Cambridge: Cambridge University Press, 2001), especially Chap. 7, "Mind, Body, and the Laws of Nature in Descartes and Leibniz," 133-167. See also John R. Milton, "The Origin and Development of the Concept of the 'Laws of Nature'," *Archives européennes de Sociologie* 22 (1981): 173-195.

- <sup>10</sup> According to Catherine Wilson, "From Limits to Laws: The Construction of the Nomological Image of Nature in Early Modern Philosophy," in *Natural Law and the Laws of Nature in Early Modern Europe*, ed. Lorraine Daston and Michael Stolleis (Aldershot: Ashgate, 2008), 13-28, this is actually what made it possible for Descartes to posit the origin of the universe as a sort of 'chaos' without 'chance'. The notion of the whirlpools - as Descartes himself stressed several times - is not in disagreement with the Atomist version of the origins of the universe. He does distance himself quite clearly from the Atomists, however, insofar as the development of the universe from the original chaos obeys laws rather than the *automaton* of Democritus, Epicurus and Lucretius.
- <sup>11</sup> See also the Letter CXLVI to Mersenne of October 11, 1638, AT II, 380, CSMK, 124.
- <sup>12</sup> His physiology, for example, writes Mesnard in "L'esprit de la physiologie cartésienne [*The Spirit of Cartesian Physiology*]," 199, "...was never presented as an exhaustive explanation: in all Cartesian constructs there are a small number of formative ideas [*idées-mères*] whose limited dialectics control the entire body of the planned discipline."
- <sup>13</sup> See *La Recherche de la Verité par la lumière naturelle*, AT X, 504, CSM II, 404.
- <sup>14</sup> AT X, 503, CSM II, 403-404.
- <sup>15</sup> AT X, 513, CSM II, 408.
- <sup>16</sup> AT I, 21.
- <sup>17</sup> A number of slight misunderstandings with his long-time friend, Father Mersenne, arise out of this topic starting as early as the late 1620s. Curious to hear the opinion of his brilliant young colleague, Mersenne does not hesitate to ask for clarification on a series of apparently "strange" phenomena, such as the spots that a mother's imagination produces on the fetus and which then appear on the new-born baby. Although the subject is "worthy" of examination, responds Descartes, in reality he has not yet addressed himself to it. See AT I, 153, CSMK, 26. See also the letter dated December 18, 1629. AT I, 83 ff., CSMK 13 ff. This is not about having or not having faith in individual observations. But, inasmuch as they are addressed to "singular" phenomena and cannot be universalized, they hold no interest.
- <sup>18</sup> On the appearance and frequency of the monstrous in the second half of the 17th century see Emile Bouvier, "La croyance au merveilleux à l'époque classique," in *Mélanges d'histoire littéraire offerts à Daniel Mornet* (Paris: Nizet, 1951): 99-108, who shows how belief in the supernatural influences and interacts with all the fields of inquiry (and discoveries) of the Enlightenment. See, of course, also Lynn Thorndyke, *A History of Magic and Experimental Science* (New York: Cambridge University Press, 1941).
- <sup>19</sup> AT X, 380, CSM I, 20.
- <sup>20</sup> *Sextæ Responsiones*, in AT VII, 436, CSM I, 294.
- <sup>21</sup> AT VIII-1, 323, CSM I, 285.
- <sup>22</sup> AT III, 121, CSMK, 148. Both the mother and child have the same "disposition" in the brain, and therefore it is possible to deduce that "chaque membre de l'enfant correspond à chacun de ceux de la mere, comme on peut prouver par raison mechanique". On the fetus in Cartesian metaphysics, see Rebecca M. Wilkin, "Descartes, individualism, and the fetal subject," *Differences: A Journal of Feminist Cultural Studies* 19 (2008): 96-127.

- <sup>23</sup> Described by Petrus Forestus [Pieter Van Foreest], *Observationum et curationum chirurgicarum libri quatuor posteriores de vulneribus, ulceribus, fracturis, luxationibus* (Lugduni Batavorum: ex officina Plantiniana Raphelengii, 1610).
- <sup>24</sup> Rebecca M. Wilkin, "Essaying the Mechanical Hypothesis: Descartes, La Forge, and Malebranche on the Formation of Birthmarks," *Early Science and Medicine* 13 (2008): 533-567.
- <sup>25</sup> AT III, 122.
- <sup>26</sup> AT IV, 568-577, CSMK, 302-304.
- <sup>27</sup> Epistola CDLX, AT IV, 573, CSMK, 302-303.
- <sup>28</sup> AT IV, 575, CSMK, 303-304.
- <sup>29</sup> CSM II, 21, AT VII, 32. The French version is more rhetorically "aggressive" and powerful compared to the "automata" of the Latin text. The capacity of an automaton to walk is not excluded in principle from Cartesian philosophy, nor is it particularly problematic. All the more interesting, then, is the fact that these neutral and, all in all, reassuring "automatons" become disturbing "spectres [ou] hommes feints qui ne se remuent que par ressorts [phantoms [or] fake human beings who only move by means of springs]." Cfr. AT IX, 25.
- <sup>30</sup> AT IX, 29 for the French version, AT VII, 37 for the Latin, CSM II, 25.
- <sup>31</sup> CSM II, 26.
- <sup>32</sup> AT XI, 184.
- <sup>33</sup> See the closing passage of the First Meditation, AT IX, 18, CSM II, 15.
- <sup>34</sup> On the First Meditation, see Denis Kambouchner, *Les Méditations métaphysiques de Descartes, I, Introduction générale, Première Méditation* (Paris: Presses universitaires de France, 2005).
- <sup>35</sup> CSM II, 13, AT IX, 15 for the French version VII, 20 for the original Latin text.
- <sup>36</sup> See Horace, *Ars poetica*, trans. by A.S. Kline, in *Poetry in Translation*, <http://tkline.pgcc.net/> (accessed May 28, 2010), 1-13.
- <sup>37</sup> See Fragment B 23, in Hermann Alexander Diels and Walther Kranz, *Die Fragmente der Vorsokratiker* (Berlin: Weidman, 1952), trans. by K. Freeman, in *Ancilla to the Pre-Socratic Philosophers: A Complete Translation of the Fragments in Diels* (Cambridge (Ma): Harvard University Press, 1948), 75.
- <sup>38</sup> The issue is treated masterfully by Jackie Pigeaud, "La greffe du monstre," *Revue des Études Latines* 66 (1988): 197-218 and Jackie Pigeaud, "La rêverie de la limite dans la peinture antique," *La part de l'Œil* 6 (1990): 115-124.
- <sup>39</sup> CSM II, 13-14, AT VII, 20.
- <sup>40</sup> CSM II, 24, AT IX, 27.
- <sup>41</sup> CSM II, 25, AT IX, 28.
- <sup>42</sup> For more on theodicy in Descartes, in addition to Landucci, see Zbigniew Janowski, *Cartesian Theodicy: Descartes' Quest for Certitude* (Dordrecht : Kluwer, 2002); C.P. Ragland, "Descartes's Theodicy," and lastly, Denis Kambouchner, "Y a-t-il une théodicée cartésienne?," in Antoine Grandjean (éd.), *Théodicées* (Hildesheim-Zürich-New York: Olms, 2010): 41-58.

- <sup>43</sup> I do not agree, therefore, with Pierre Guenancia, “Un Dieu trompeur est-il un monstre?,” in *La vie et la mort des monstres*, ed. by J.-C. Beaune (Seysssel: Champ Vallon, 2004), 149-155, who claims that only the deceiver God can be understood as a “monster”, while the evil genius is only one of the many poetic inventions Descartes makes use of without constituting a real threat to the whole system. Descartes used this type of device to settle the accounts once and for all, concludes Guenancia, starting from the time of the *Regulæ*. In my view, even the “minor” fictional devices, like the evil genius, constitute real obstacles to Descartes. Or rather, they constitute real opportunities to productively exploit the issue of monstrosity and its attendant ontological problems based on a precise rhetorical strategy.
- <sup>44</sup> Meditation I, CSM II, 15, AT IX, 18.
- <sup>45</sup> Meditation II, CSM II, 17, AT IX, 19.
- <sup>46</sup> Tullio Gregory, “Dio ingannatore e Genio maligno. Note in margine alle “Meditationes” di Descartes,” *Giornale critico della filosofia italiana* 28 (1974): 477-516.
- <sup>47</sup> AT VI, 231.
- <sup>48</sup> *Ivi*.
- <sup>49</sup> *Ibid.*, 366.
- <sup>50</sup> See Daston and Park, *Wonders and the Order of Nature*, 255-301.
- <sup>51</sup> AT XI, 373, art. LIII, CSM I, 350. See also AT VI, 380. Etienne Gilson, *Index Scolastico-Cartésien* (Paris: J. Vrin, 1979), 215, provides a helpful reference to *Commentarii in tres libros de Anima Aristotelis* (Conimbricæ, 1598), Lib. 3, cap. 13, quæst. 1, art 5.
- <sup>52</sup> AT XI, 380, CSM I, 353.
- <sup>53</sup> *Ibid.*, 381, CSM I, 353.
- <sup>54</sup> *Ibid.*, 383, CSM I, 354.
- <sup>55</sup> *Ibid.*, 384, CSM I, 354-355.
- <sup>56</sup> *Ibid.*, 385, CSM I, 355.
- <sup>57</sup> Descartes is perfectly in harmony, in these passages, with the concept of admiration understood as *curiositas* that Augustine describes in *De vera religione*, caput XLIX, 163, in *Patrologia Latina*, ed. by Jacques-Paul Migne, (Paris: J. P. Migne, 1841), vol. 34, 121-172.
- <sup>58</sup> AT XI, 386, CSM I, 355-356.
- <sup>59</sup> See AT XI, 503.
- <sup>60</sup> The text, moreover, is open and ambiguous enough to be compatible with profoundly different, later mechanistic positions, such as Spinoza's rigid anti-finalism or the theocentric and finalistic mechanism of Malebranche.
- <sup>61</sup> The term comes from Roger, *Les sciences de la vie*, 144.
- <sup>62</sup> See AT XI, 524.
- <sup>63</sup> *Principes* III,2, AT VIII, 80-81, CSM I, 248. He writes about this again to Elizabeth in September 1645, in AT IV, 292, CSMK, 266.
- <sup>64</sup> AT IX, 44, CSM II, 30.

<sup>65</sup> AT VIII-1, 15, CSM I, 202.

<sup>66</sup> Part III, 195, AT XI, 475, CSM I, 397-398.

<sup>67</sup> Part III, 198, AT XI, 476, CSM I, 398-399.

<sup>68</sup> Defender of a knowledge of final causes as not only necessary but also sufficient for understanding efficient causes. See Pierre Gassendi, *Disquisitio Metaphysica seu Dubitationes et Instantiæ Adversus Renati Cartesii Metaphysicam et Responsa*, ed. by Bernard Rochot (Paris: J. Vrin, 1962), *Dubitatio* I, 395-417.

<sup>69</sup> Who accuses Descartes of having taken a major step forward, but of not knowing or being able to draw all the necessary consequences from his philosophy. See Benedictus de Spinoza, *Ethics*, V, Preface, in *Complete Works*, ed. by Samuel Shirley (Indianapolis (In): Hackett, 2002), 363-365.

<sup>70</sup> AT IX, 44, CSM, 39.

<sup>71</sup> Second set of objections, AT VII, 125, IX, 99, CSM II, 89.

<sup>72</sup> Second set of replies, AT VII, 141, CSM II, 101. Descartes' reply is clearly effective in responding to the ingenuous objection of Mersenne's hypothetical atheist. However, this teetering from one sphere to another, from the ethical to the physical-mathematical, or at least epistemological - and the tension between the two that I am trying to bring to light - presents certain difficulties, and does not escape the notice of someone who is much less naïve, such as Antoine Arnauld. See the *Objections to the Fourth Meditation*, *ibid.*, 167-68.

<sup>73</sup> AT XI, 36-7, CSM I, 92.

<sup>74</sup> *Ivi.*

<sup>75</sup> See also the Third Meditation, AT IX, 38-9, CSM II, 26-27.

<sup>76</sup> AT XI, 46-47, CSM I, 97.

<sup>77</sup> See Aristotle, *Generation of Animals* (London: Heinemann and Cambridge (MA): Harvard University Press 1963), IV, 3 767 a 13, as well as IV, 4 770 b 10. See also *The Physics* (London: Heinemann and Cambridge (MA): Harvard University Press, 1952), II, 9 199 b.

<sup>78</sup> See Canguilhem, "Organisme et modèle mécaniques," 297-98.

<sup>79</sup> This subject is amply developed elsewhere, along with the introduction of the statistical and probabilistic point of view into biology. See "La monstruosité et le monstrueux" and "Le normal et le pathologique," in *La connaissance de la vie* (Paris: J. Vrin, 1992).

<sup>80</sup> AT IX, 103, CSM I, 248.

<sup>81</sup> And which Cartesianism will soon begin to have to take stock of when confronted by reports such as the one appearing in the *Philosophical Transactions of the Royal Society of London* 2 (1667): 480: "another Monster was produced, which was an Infant come to maturity, having instead of a Head and Brains, a Mass of flesh like any Liver; and was found to move. And this *Foetus* occasioned a Question for the *Cartesians*, how the motion could be performed, and yet the *Glandula pinealis*, or *Conarium* be wanting; nor any Nerves visible, which come from the Brain? The marrow in the *Spine* was of the same substance. It liv'd four days, and then dyed." See L. Thorndyke, *History of Magic and Experimental Science* (New York: Columbia University Press, 1958) VIII, 253.