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A Deflationist Solution to the Problem of Force in Descartes

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ABSTRACT

The ontological status of forces and their causal role in Descartes' physical world is debated among Descartes scholars. The question of forces is embedded in another more general question, namely to determine which causal activity should be attributed to God, and which causal activity should be attributed to physical bodies. Three distinct positions were attributed to Descartes: 1. he was an occasionalist and he attributed no causal power to forces, 2. he was a pure conservationist and he conceived forces as entities distinct from matter and motion, 3. he was a concurrentist who attributed causal activity both to God and to second causes, especially to forces and laws. These three interpretations seem to exhaust the possibilities. In this chapter however, I defend another interpretation of Descartes' position, according to which God intervenes in this world only to conserve it by his ordinary concurrence (in this I agree with the conservationist interpretation), without, for all that, forces or laws being specific entities (in this I agree with the occasionalist interpretation). My interpretation leads to downplaying the strong relationship which is assumed to exist between Descartes' physics and his metaphysics.

KEYWORDS

Descartes; forces; causes; physics; metaphysics.

As Desmond Clarke noted by, the ease with which Descartes uses the term *vis* suggests that it was for him a spontaneous way of explaining the motion of bodies, rather than

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a term denoting a meticulously crafted concept.¹ In that sense, it is not sure that, for Descartes himself, there was ever a problem of force. But, for Descartes scholars, there is obviously a question about the ontological status of forces and about their causal role. This question is embedded in another more general one, namely to determine which causal activity should be attributed to God, who is the primary cause, and which causal activity should be attributed to the so-called secondary causes, that is, bodies with their various capacities – motions, forces, laws. Let us call this other more general question the metaphysical question of causal agency. Three positions were recently attributed to Descartes in this respect: 1. he was an occasionalist, who attributed no causal power to forces, 2. he was a pure conservationist, who conceived forces as entities distinct from matter and motion, 3. he was a concurrentist, who attributed causal activity both to God and to second causes, especially to forces and laws.

At first glance, these three interpretations of Descartes's position seem to exhaust the possibilities, whether the causal activity is attributed to God (occasionalism), to forces or laws being ontological entities distinct from matter and of movement (conservationism), or to both (concurrentism). In this chapter, however, I would like to defend a fourth interpretation of Descartes, according to which God intervenes in this world only to conserve it by his ordinary concurrence (in this I agree with the conservationist interpretation), without, for all that, forces or laws being specific entities (in this I agree with the occasionalist interpretation). This interpretation is deflationist since, from a causal point of view, it reduces God to a distant first cause and since, from an ontological point of view, it reduces forces to matter and its motions. I do not deny that forces have a causal role for Descartes, I simply deny that such a causal role supposes that they are specific entities. As we will see, it leads to downplaying the strong relationship which is assumed to exist between Descartes' physics and his metaphysics.

I shall proceed in three steps. I begin by highlighting the main arguments that lead me to reject the existing interpretations, and, more precisely, certain aspects of the existing interpretations. Returning next to the *Principia philosophiae*, I show that a metaphysical notion of force and a physical notion of force should be distinguished and that physical force, without being an additional ontological entity, nevertheless has a real causal role when there is an exchange of motion between bodies. In a third and final part, I suggest that one common

¹ Desmond Clarke, "The Concept of *Vis* in Part III of the *Principia*," in *Descartes: Principia philosophiae (1644-1994). Atti del Convegno per il 350° anniversario della pubblicazione dell'opera (Parigi, 5-6 maggio 1994; Lecce, 10-12 novembre 1994)*, eds. Jean-Robert Armogathe and Giulia Belgioioso (Napoli: Vivarium, 1996), 321-39.

point to the three usual interpretations to which the deflationist interpretation is opposed to is that they put Descartes' physics and its metaphysics on the same plane, so to speak.

1. In the final chapter of *Descartes' Metaphysical Physics*, Daniel Garber defends two theses about the Cartesian physical world. The first thesis is "fictionalist," "nullibiquitous" or "nominalist" as far as forces are concerned: even if bodies behave as if there were forces, forces are actually nowhere, neither in God nor in the physical bodies, and they are just names.² Garber is here more radical than Gary Hatfield, who indeed banished forces from Cartesian bodies, but nevertheless attributed to them some kind of reality by putting them in the hands of God. Garber's second thesis, with regards to the metaphysical question of causal agency, amounts to attributing to Descartes a form of occasionalism: Descartes' physical bodies do not have the force to move each other, only God and finite spirits can do it.³ Here Garber agrees with Hatfield to say that, in the Cartesian world, God possesses a causal agency on the physical bodies, which they lack by themselves.⁴ According to Garber, the truth of Descartes' world is Malebranche's occasionalist world, even if their occasionalisms are distinct, Descartes' occasionalism being based on the passivity of the bodies, while Malebranche's occasionalism relies on their finite character of bodies.⁵ This occasionalist interpretation of Descartes is based on two arguments, because God is both a substantial cause of the existence of bodies and a modal cause of their motion. In the first place, there is an argument from what Garber calls "the doctrine of divine sustenance," that is the doctrine of creation as continuous creation: since a finite substance can not conserve itself and since the same action is necessary from the part of God to conserve a substance and to create it, God brings bodies to existence and sustains them. Second, and most importantly,

² Daniel Garber, *Descartes' Metaphysical Physics* (Chicago: Chicago University Press, 1992), 293-299. Garber's position is described as "nominalist" by Dennis Des Chene, *Physiologia. Natural Philosophy in Late Aristotelian and Cartesian Thought* (Ithaca, London: Cornell University Press, 1996), 313-4, as "nullibiquitous" by Clarke, "The Concept of *Vis*," 125, and as "fictionalist" by Schmalz, Tad Schmalz, *Descartes on Causation* (New York: Oxford University Press, 2008), 105, 116.

³ Garber, *Descartes' Metaphysical Physics*, 299-305.

⁴ Gary Hatfield, "Force (God) in Descartes Physics," *Studies in History and Philosophy of Science* 10 (1979): 113-140.

⁵ Daniel Garber, "Descartes and Occasionalism," in *Causation in Early Modern Philosophy*, ed. Steven Nadler (University Park: Pennsylvania State University Press, 1993), 9-26. makes the differences between Descartes' doctrine and "standard" occasionalism more explicit by distinguishing three cases of interaction (body-body, mind-body, body-mind). According to Garber, the only domain where Descartes defends explicitly occasionalist theses is the physical domain, and, if bodies can not cause motion, it is not because they are finite, but because they are not active (this is why finite minds are able to cause motion in bodies, but also why Descartes should have thought that bodies can not act on minds.)

there is an argument from what Garber calls the “divine impulse view”: after the dispartion of the substantial forms that used to explain what bodies are and what they do, the motion, directly caused by God, would take over.⁶ In itself, the doctrine of divine sustenance is no argument for occasionalism. As Descartes reminds us, this doctrine was namely “commonly accepted among theologians,” and even “a manifest truth” for all metaphysicians.⁷ It is therefore on the doctrine of divine impulse that the refutation of Garber’s occasionalist interpretation must concentrate.

For that, we can begin by noting that, whenever Descartes evokes the way in which God acts in the world, he explicitly uses a restriction to emphasize that the *only* thing God does in the world is, because of his immutability, to sustain things as he created them. In *The World*, he notes that many changes happen “from the *mere fact* [*de cela seul*] that he [God] continues thus to conserve it [matter]”⁸; while “the two [first] rules follow manifestly from the *mere fact* [*de cela seul*] that God is immutable and that, acting always in the same way,... supposing that God placed a certain quantity of motion in matter in general at the first instant he created it,... he always conserves the same amount of motion in it,” the third and last rule “depends *solely* on [*ne dépend que de*] God’s conserving each thing by a continuous action.”⁹ Similarly, in the summary of *The World* that he gave in the *Discourse on the Method*, he puts forth the hypothesis that, after creating matter and imparting some motion to it, God “did *nothing but* [*il ne fist autre chose que*] lend his ordinary concurrence to nature.”¹⁰ Last, but not least, in the *Principia*, he introduces the discussion on the general cause of motion by the following: “as far as the general cause [of motion] is concerned, it seems clear to me that this is no other than God himself, who in the beginning created matter alongside with motion and rest, and who now, *merely* by his ordinary concurrence [*per solum concursum ordinarium*], conserves as much motion and rest in the whole of matter as he first introduced.”¹¹ All these texts do not exactly say the same thing, but the general picture can be summarized by the three following propositions:

i/ The immutability of God implies the doctrine of conservation as continuous creation. *A parte rerum*, this doctrine means that bodies need to be conserved as well as created. *A parte Dei*, it means that God’s action when he conserves is the same as God’s

⁶ Garber, *Descartes’ Metaphysical Physics*, 273-280.

⁷ Descartes, *Discourse on the Method*, AT VI 45, CSM I 133; *Quintae responsiones*, AT V 369, CSM II 253.

⁸ Descartes, *The World*, AT XI 37, CSM I 92-3, modified.

⁹ Descartes, *The World*, AT XI 43 and 44, CSM I 96, modified.

¹⁰ Descartes, *Discourse on the Method*, AT VI 42, CSM I 132, modified.

¹¹ Descartes, *Principia philosophiae*, II 36, AT VIII 61, CSM I 240, modified.

action when he creates – contrary to what we could think, God does not act *more* when he creates than when he conserves.

ii/ God's ordinary concurrence is nothing *more* than the action through which he conserves bodies in their existence.¹² Here, God's ordinary concurrence is implicitly opposed to his extraordinary concurrence, when he performs miracles.¹³

iii/ In order to account for the changes that we observe in nature, we don't need *more* than God's ordinary concurrence or than God's conservation.

We have now enough material to formulate an argument against Garber's occasionalist interpretation. The very restrictions that I underlined indicate that Descartes opposed theses that would have attributed to God more than he himself did: against these theses, he argued that once matter and motion were created, there was no need to attribute to God more action than the action by which he conserved what he created, which corresponds to what is called his ordinary concurrence. Now, occasionalism is the strongest thesis that can be defended concerning the action of God in the world since it amounts to attributing no causal agency to bodies and to placing causal agency entirely in the hands of God. Consequently, if Descartes had been an occasionalist, he would not have been able to oppose theses that attribute more to God than he did. In these circumstances, it seems reasonable to conclude that Descartes was not an occasionalist, and even, considering iii/, that he was a pure conservationist.

In chapter 3 of *Descartes on Causation*, Tad Schmaltz defends two theses on the Cartesian physical world that are diametrically opposed to those of Garber. In the first place, he agrees with me that, far from being an occasionalist, Descartes was a pure conservationist - which, in the range of doctrines conceivable at the time, amounts to attributing as little as possible to God, since, in a conservationist view, God does nothing in the world that he created, but to conserve it through his ordinary concurrence as he created it. Schmaltz's second thesis is more problematic. It amounts to defend a form of causal realism concerning

¹² See as well Descartes to Hyperaspistes, August 1641, AT III 429 and to Mersenne, 21 April 1641, AT III 360 referring to *Primae responsiones*, AT VII 109. For comments, see Geoffrey Gorham, "Cartesian Causation: Continuous, Instantaneous, Overdetermined," *Journal of the History of Philosophy* 42-4 (2004): 389-423, here 407-8, and Schmaltz, *Descartes on Causation*, 99-105, 127-8. Des Chene, *Physiologia*, 334-336, first suggested that God's concurrence manifests itself in moving forces, while his capacity to conserve manifests itself in resisting forces. However, in his answer to Helen Hattab, "The Problem of Secondary Causation in Descartes: A Response to Des Chene," *Perspectives on Science* 8 (2000), 93-118, here 105-6, Dennis Des Chene, "On Laws and Ends. Reply to Hattab and Menn." *Perspectives on Science* 8 (2000), 144-63, here 147, he seems to retreat back and renounce this distinction.

¹³ Descartes, *The World*, AT XI 48, CSM I 97: "suppose in addition that God will never perform any miracle in the new world."

forces and to attribute to them a non-derived ontological reality as modes of duration.¹⁴ Schmaltz sometimes seems to attribute a pre-Leibnizian position to Descartes, according to which “the nature of bodies is not exhausted by the purely geometric and kinematic aspects of motion,”¹⁵ but this assertion is difficult to admit given Descartes’ ambition to account for the material world only through the extended substance and the modes that figure and motion are. Schmaltz’s thesis is actually that forces are modes of the extended substance similar to duration, or, more specifically “durational tendencies.”¹⁶ He reaches this conclusion by developing some suggestions from Martial Gueroult and Alan Gabbey. Gueroult wrote that, according to Descartes, “force, duration and existence are one and the same thing under three different aspects.”¹⁷ Such an interpretation is not without its problems, since substance, existence and duration remain unmodified, while forces vary.¹⁸ Gabbey proposed a solution to this problem by distinguishing two kinds of forces, that correspond to the scholastic distinction between causes *secundum esse* and causes *secundum fieri* that Descartes uses in *Quintae responsiones* and to the distinction between invariable attributes and variable modes that he made in *Principia philosophiae*.¹⁹ According to Schmaltz, at this point, it remains to determine the kind of modes that forces are. He answers this question by applying the distinction between attributes and modes to duration: true enough, duration as such is an invariable attribute, but one can identify in the duration of bodies various modal parts, to which variable forces as causes *secundum fieri* would correspond.²⁰

A first objection against the identification of forces to durational tendencies could be that it contradicts two Cartesian claims: duration is an attribute, forces are not modes.²¹ This first objection may, however, be left aside, since two meanings of force and two meanings of duration have been distinguished. Still, there is a more serious objection to such an

¹⁴ Schmaltz, *Descartes on Causation*, 116-21. Tad Schmaltz, *Early Modern Cartesianisms. Dutch and French Constructions* (Oxford: Oxford University Press, 2016), 167-75, is more concise and does not mention the hypothesis that forces are durational tendencies.

¹⁵ Schmaltz, *Descartes on Causation*, 88.

¹⁶ Schmaltz, *Descartes on Causation*, 88.

¹⁷ Martial Gueroult, “Métaphysique et physique de la force chez Descartes et chez Malebranche. Première partie: Descartes,” *Revue de métaphysique et de morale* 59-1 (1954) 1-37, here 3.

¹⁸ Descartes, *Principia philosophiae*, I 56, AT VIII 26, CSM I 211-2. Descartes then argues that there is only a conceptual distinction between the substance and its duration (I 62, AT VIII 32, CSM I 214).

¹⁹ Alan Gabbey, “Force and Inertia in the Seventeenth Century: Descartes and Newton,” in *Descartes: Philosophy, Mathematics and Physics*, ed. Steven Gaukroger (Brighton, The Harvester Press, Barnes and Noble Books, 1980), 230-319, here 234-8.

²⁰ Schmaltz, *Descartes on Causation*, 117-8.

²¹ Descartes, *Principia philosophiae*, I 65, AT VIII 32, CSM I 216.

identification: we don't see any relationship between duration, even if it consists of different modal parts, and the way in which Descartes proposes to "calculate how much force there exists in each body [*calculo subducere, quantum in unoquoque sit virium*]." ²² Indeed, nothing that evokes parts of duration intervenes in the calculation of forces that Descartes makes. To understand this objection, let us give an example: suppose a very small body that moves with a very small speed but that has an eternal duration, its force to resist another body that it meets will be very small, while its "durational tendency" will be infinite. Descartes' physical ontology not only forbids that forces are specific entities distinct from the purely geometrical aspects of matter and motion, it also prevent them to be modes similar to duration.

To tell the truth, one has the feeling that Schmaltz, while permuting the role of force and the role of God, nevertheless retained Garber's idea that, if one does not attribute the causal efficacy to God, then it must be placed in forces, and that he consequently tried to find an ontological status for forces. In the very systematicity of the opposition between Garber's interpretation and Schmaltz's interpretation, there is indeed something constant, which is the application of a principle of compensation. According to this principle, what God does not do, the forces do; conversely, what the forces do not do, God does. Or again: if we have a metaphysical causal explanation of an effect, we can dispense with explaining it physically; conversely, if we have a physical causal explanation of an effect, we can dispense with explaining it metaphysically. As I will now show, to the disjunction underlying the principle of compensation (either God, or the forces), historians who have proposed a concurrentist interpretation of Descartes have substituted a conjunction (both God and the forces).

Historians of medieval metaphysics, beginning with Alfred Freddoso, coined the category of concurrentism to designate a mixed position between occasionalism and mere conservationism, according to which both God (the first cause) and bodies (the second causes) concur to the production of the effect. ²³ As they pointed out, concurrentism does not amount to saying that the two causes collaborate to produce the effect at stake, but rather that both of them produce it completely, though in different ways, since the finite cause is subordinated to the infinite cause. This is for example the case if God causes the existence of a being, while bodies cause its determination – it is a body of this species rather than a body of that species.

²² Descartes, *Principia philosophiae*, II 45, AT VIII 67, CSM I 244.

²³ See for example Alfred Freddoso, "God's General Concurrence with Secondary Causes: Why Conservation Is not Enough," *Philosophical Perspectives*, 5 (1991): 553-85.

Those who attributed to Descartes some form or another of concurrentism, most notably Kenneth Clatterbaugh, Andrew Pessin and Helen Hattab, put forwards two main arguments²⁴:

i/ There are a number of occurrences of the term “concurrence [*concursum*]” in Descartes’ works.

ii/ God is described as a universal cause of everything, while bodies appear as genuine causes: attributing to Descartes concurrentism would explain why he does not choose between ascribing causality to God and ascribing it to bodies – he can have both.

The first argument is weak if one believes, as I do, that Descartes does not distinguish the ordinary concurrence of God from his action of creation or conservation. The second one is stronger. But the general problem that concurrentism faces is particularly valid for Descartes’ concurrentist interpretation: it is to determine how the first cause and the secondary causes concur in producing an effect without being redundant. To find an answer to this problem, Kenneth Clatterbaugh defends a concurrentism that one could call “deductive,” while Helen Hattab and Andrew Pessin defend a nomic concurrentism. Here, I shall discuss only Hattab’s interpretation, which is the most accomplished. According to Hattab, God having created motion in general and conserving it, the laws of motion would be the secondary causes.²⁵ But on the one hand, whatever she writes, Descartes says that the motion is conserved and exchanged *according to* laws, not that the laws *cause* the conservation and the exchange of motion: in this sense, it is difficult to understand how laws could be causes.²⁶ On the other hand, to say that the laws are secondary causes distinct from the first cause is to neglect the fact that Descartes presents them as manifestations of the immutability of God, in other words as inseparable from God. In fact, Hattab having argued that the laws constitute “constraints on God’s action,” but, recognizing that this poses a problem since they manifest the immutability of God, comes to declare that it is the existence of the material world which

²⁴ Kenneth Clatterbaugh, “Cartesian Causality, Explanation, and Divine Concurrence,” *History of Philosophy Quarterly* 12-2 (1995): 195-207; Andrew Pessin, “Descartes’s Nomic Concurrentism: Finite Causation and Divine Concurrence,” *Journal of the History of Philosophy*, 41-1 (2003): 25-50; Hattab, “The Problem of Secondary Causation”. Although Gorham himself, in “Cartesian Causation” criticizes the concurrentist interpretation of Descartes and defends instead an “overdeterminist” interpretation, according to which God causes the effect E and causes the cause C to cause the effect E, his interpretation can be seen as a form of concurrentism (since both God and C cause E) or even as an occasionalism (both God and C causing E, but God being necessary, C can be overlooked).

²⁵ I mention the two texts motivating Hattab’s interpretation below, notes 40 and 44.

²⁶ Hattab, “The Problem of Secondary Causation,” 114, recognizes the problem but does not give any convincing answer. Dennis Des Chene, “On Laws and Ends. Reply to Hattab and Menn.” *Perspectives on Science* 8 (2000), 144-63, here 151-2, insists that Descartes, far from developing the law analogy, treats the laws as mere consequences of God’s immutability.

makes the laws of nature distinct from God. But this obviously amounts to contravene another important property of God, namely its omnipotence.²⁷

The review of the existing interpretations thus leads, for the moment in a purely negative way, to the hypothesis that Descartes was not an occasionalist and that he was probably even a conservationist (*pace* Garber), that he did not attribute to the forces a specific ontological reality (*pace* Schmaltz) and, finally, that the laws of nature can not be the secondary causes (*pace* Hattab). It is now necessary to return to the text of the *Principia philosophiae* to test these hypothesis and to advance a positive interpretation.

2. It is quite possible that, as Garber noted, “there may not be an altogether view of the ontology of force in Descartes, one that is coherent and sensible, and is consistent with what he says about force in all of his writings and what he commits himself to in other contexts.”²⁸ But I think that the essential step forward amounts to recognizing that there are two notions of force and two notions of cause in *Principia philosophiae*.²⁹ I am not the first to emphasize this point. For example, Gueroult distinguishes from the outset forces as causes, that, being identical with divine conserving force, are not modes of corporeal substances, from forces as effects, that are modes of corporeal substances and, as such, belong to the conserved world. According to Gueroult, while substances depend on forces as expressions of the creative action of God, forces as modes depend on substances.³⁰ As I already mentioned when I discussed Schmaltz’s interpretation, Gabbey highlighted the description that Gueroult gave of the ambiguous situation of forces with respect to God and the created world through the scholastic distinction between causes *secundum esse* and causes *secundum fieri* and through the Cartesian distinction between attributes and modes. By way of a conclusion, Gabbey underlined the distinction between the practical level of physical investigation and the true level of metaphysical enquiry: “Strictly speaking God is the ultimate real cause and the only true substance, but speaking at the “practical” level of physical investigation, forces —

²⁷ Hattab, “The Problem of Secondary Causation,” 112-4.

²⁸ Garber, *Descartes’ Metaphysical Physics*, 297.

²⁹ There are obviously other notions of physical force than the one that appears in articles II 43-45 of *Principia philosophiae*. In his letter to Huygens, 5 October 1637, AT I 435-436, Descartes developed for example a notion of static force. On other physical forces in Descartes, see Clarke, “The Concept of Vis”; Richard S. Westfall, *Force in Newton’s Physics. The Science of Dynamics in the Seventeenth Century* (London: MacDonald and New York: American Elsevier, 1971), 529-533. In the following, I develop some indications already given in Sophie Roux, “Découvrir le principe d’inertie,” *Recherches sur la philosophie et le langage* 24 (2006) 453-515. Gabbey, “Force and Inertia” and Jean-Pierre Sérès, *Machine et communication* (Paris: Vrin, 1987) were at the time important to my thinking.

³⁰ Gueroult, “Métaphysique et physique de la force,” 5-9. See also 35-6.

whether of motion or of rest — are real causes in their own right and distinct from motion and rest.”³¹ Finally, Dennis Des Chene maintained that forces present two distinct and uncorrelated aspects: on the one hand, as active powers that move bodies, they pertain to God; on the other hand, as measures of the quantity of motion by extension and speed, they concern bodies.³² Even if, as I will explain in the third part of this chapter, I have another position on the relation between metaphysics and physics, like Gueroult, Gabbey and Des Chene, I believe that it is essential to distinguish between two notions of force and two ways of being a cause in book II of *Principia philosophiae*. On the one hand, force is a metaphysical cause that creates and conserves motion; on the other hand, it is a physical cause that determines a change of motion.

These two notions of force are introduced in *Principia philosophiae*, II 36, where Descartes says that there are two causes of motion, on the one hand “the universal and primary cause, the general cause of all the motions in the world,” on the other, “the peculiar cause through which individual pieces of matter acquire some motion which they did not have before.”³³ The rest of the article 36 indicates that “the universal and primary cause” is God who, by his ordinary concurrence, “conserves [*conservat*]” as much motion and rest as he first created. A basic but crucial remark is that these two causes are not causes in the same way. In saying that the universal cause is the general cause of all motions, Descartes does not intend to condense a series of statements associating a particular cause to a motion, as he would if he said for example that all rainbows have for cause the rain in general, to condense a series of statements associating each individual rainbow to the particular rain that is its cause. Rather, his point is to say that when we ask the question of what causes motion, we can answer this question in two different ways, either by looking for the efficient cause that produces the totality of the motions (all the motions in as much as they constitute a certain quantity of motion), or by looking for the cause of a change of motion:

i/ The first cause creates and conserves all the movements. The apparent redundancy between the terms “universal,” “general,” “all [the motions]” points towards the idea that this cause is a total cause, contrary to the sun, which may well be called “the universal cause of all flowers,” but which is not their total cause, because other particular causes, which are not

³¹ Gabbey, “Force and Inertia,” 238.

³² Des Chene, *Physiologia*, 334-41 and Des Chene, “On Laws and Ends,” 146-8. Relying on what Des Chene wrote in *Physiologia*, 340, Schmaltz, *Descartes on Causation*, 105, identifies his position to Garber’s position, which amounts to neglect one aspect of Des Chene’s position.

³³ Descartes, *Principia philosophiae*, II 36, AT VIII 61, CSM I 240 modified.

subordinated to the sun, intervene in explaining the differences between roses and tulips.³⁴ In other texts, Descartes establishes a series of equivalences between being a cause *secundum esse* and conserving (in the sense of the doctrine of conservation as a continuous creation),³⁵ between conserving (in the same sense) and being an efficient cause,³⁶ between being an efficient cause and being a total cause,³⁷ and, finally, between being a total cause and subordinating all the other causes.³⁸

2 / The second cause specifies how certain parts of matter acquire motions that they did not have before, although these motions already existed in other parts of matter. It is a specific cause, that, in contrast with the adjectives applied to the first cause, can be called *secundum fieri*, particular and subordinate.

As the *Principia philosophiae* are a school textbook, one could say that this division of labor is a scholastic garment ill adapted to Descartes' thought.³⁹ This does not seem to be the case here, both because of the series of equivalences that have been recalled and because the distinction between these two kinds of cause corresponds to a division of labor that *The World* had introduced between, on the one hand, God who creates and conserves a quantity of motion (the general cause of the *Principia*), and, on the other hand, the nature which is responsible for the particular changes (the particular cause of the *Principia*): "it follows of necessity from the mere fact that he [God] continues thus to conserve it [matter], that there must be many changes in its parts which cannot, it seems to me, be properly attributed to the action of God (because that action never changes), and which therefore I attribute to nature." A few lines later, Descartes mentions the laws of motion "according to which it must be thought that God makes nature act."⁴⁰ If, on the one hand, nature causes the changes of

³⁴ Descartes to Elisabeth, 6 October 1645, AT IV 314.

³⁵ *Quintae responsiones*, AT VII 369: "Deus est causa rerum creaturarum non modo secundum fieri, sed etiam secundum esse, ideoque debet semper eodem modo influere in effectum, ut eundem conservet."

³⁶ *Primae responsiones*, AT VII 109: "non dubitarem illam causam, quae me conservat, efficientem appellare." On God as an efficient cause, see *Sextae responsiones*, 8, AT VII 436: "potest enim vocare efficiens, eadem ratione quod Rex est legis effector"; *Principia philosophiae*, I 26, AT VIII 15: "ipsum [Deum] ut causam efficientem rerum omnium considerantes," *passim*.

³⁷ Descartes to Mersenne, 27 May 1630, AT I 152: "il [Dieu] a créé toutes choses... *ut efficiens et totalis causa*."

³⁸ Descartes to Elisabeth, 6 October 1645, AT IV 314: "Dieu est tellement la cause universelle de tout, qu'il en est en mesme façon la cause totale."

³⁹ The expression "division of labor" comes naturally under the pen in this context; not surprisingly, it has been used by those who contest the occasionalist interpretation of Descartes, see Clarke, "The Concept of Vis," 333; Hattab, "The Problem of Secondary Causation," 110; Schmaltz, *Descartes on Causation*, 23, 122-123, 218.

⁴⁰ Descartes, *The World*, AT XI 37, CSM I 92-3 modified. This passage is one of the reasons why Hattab, "The Problem of Secondary Causation," 109, suggests to put aside the problem of forces and to find in laws of nature an answer to the

motion, and on the other, God causes nature to act, then, if these were transitive causes, we should say that God is the cause of change, which has been explicitly proscribed. This shows, in my opinion, that we can not treat the two causes transitively, but that we must on the contrary distinguish them strongly, saying that they are two causes which do not operate on the same plane. God is the metaphysical cause of the action of nature, but nature is the physical cause of changes of motion. On this point, *Principia philosophiae* gained clarity with regard to *The World*: detaching article II 36 dealing with the primary cause from article II 43 dealing with the cause of change of motion, was to mark the difference between the metaphysical efficient cause and the physical cause, that I called specific.

We can more generally note that Descartes is far from having reduced all causes to a single category. On the contrary, he did not hesitate to use the rich arsenal of scholastic distinctions that he had at his disposal to apprehend the different causal relations he wanted to identify. Garber made use of the distinction between being a substantial cause and being a modal cause and Steven Nadler explained that the *Notes on a Certain Broadsheet* introduced an occasional cause, “a real causal relation, albeit an inferior or secondary variety if efficient causation is taken to be the standard.”⁴¹ As we have seen, to catch the distinction between the primary cause and the secondary causes, Descartes used the opposition not only between causes *secundum esse* and *secundum fieri*, but also between the universal cause and the particular causes, or, still, between the total cause and the subordinated causes. As appears briefly in one of the letters to Elizabeth, he introduced a stark contrast between these two kinds of cause. Elizabeth could not understand how the existence of our free will could be compatible with the assertion that God is the universal and total cause: according to her, either our free will exist and we are independent from God, or God is the cause of our actions and we are dependent from him. Descartes answered her that “the independence that we experience and feel in ourselves... is not incompatible with a dependence of quite another kind [*qui est d'autre nature*], whereby all things are subject to God.”⁴² According to Descartes, if we do not have to choose between the affirmation that, having free will, we are causes of our acts, and the affirmation that God, of which we are dependent, is the cause of our acts, it is because we and God are causes of our actions in two different ways. Although

question of causal agency. Des Chene, *Physiologia*, 316-317, and Gorham, “Cartesian Causation,” 411, point out that, contrary to what happens in *The World*, Descartes makes paradoxically the mutation of things an argument for divine immutability in *Principia philosophiae*.

⁴¹ Garber, *Descartes Metaphysical Physics*, 276-8.

⁴² Descartes to Princess Elisabeth, 3 November 1645, AT IV 333, CSM III 277.

human beings are in question in this letter to Elisabeth, while I examine physical bodies in this chapter, the idea is the same: it is to emphasize that there are two causes that do not operate on the same plane. The first cause is metaphysical, the second cause is physical.

It is true that metaphysics and physics appear to be entangled in the notion of conservation: we say that God retains as much motion as he created, that the laws of nature are laws of conservation and that the body conserves its movement. But precisely, here again, Descartes makes a distinction, by using the verb “conserve [*conservare*]” to describe the action of God, though he never uses it when he refers to the motion of bodies. He writes successively that “everything, in so far as it can, always continues in the same state [*unaquaeque res, quantum in se est, semper in eodem statu perseveret*],” that “everything, in so far as it can, always remains in the same state [*unaqu[ae]que res... manet, quantum in se est, in eodem semper statu*],” and that “everything tends, in so far as it can, to persist in the same state [*unaquaeque res tendat, quantum in se est, ad permanendum in eodem statu in quo est*].⁴³ In a word, the action of conserving is reserved to God, who actually *conserves* the quantity of motion that he created in the world, while bodies only *tend* to stay in their state of motion.

But what now about the physical cause, which specifies the manner in which changes of motion happen? Of this specific cause, article II 36 says nothing except that it intervenes when a part of matter acquires a motion that it did not have. One can therefore think that this cause has something to do with the third law of nature, which says how bodies that meet exchange motion, so that some of them acquire motion, while others lose motion. In fact, things are a bit more complicated than that because article II 37, which introduces the very notion of laws of nature, present them somewhat mysteriously as “secondary and particular causes of the various motions we see in every specific body,” as if all three laws of nature were indeed “secondary and particular causes.”⁴⁴ It is only in article II 40 that something more explicit is said about the secondary and particular causes: the third law, which covers “all the particular causes of the changes which bodies undergo [*omnes causae particulares mutationum, quae corporibus accident, in hac lege continentur*],” states that these changes of motion depend on the relative forces of the bodies that meet.⁴⁵ While II 37 presents all three

⁴³ *Principia philosophiae*, II 37 and 43, AT VIII 62 and 66, CSM I 240-1 and 243.

⁴⁴ *Principia philosophiae*, II 37, AT VIII 62, CSM I 240. Helen Hattab, “The Problem of Secondary Causation,” 108-16, insists on II 37 in order to defend her thesis that laws are secondary causes, but neglects II 40.

⁴⁵ *Principia philosophiae*, II 40, AT VIII 65, CSM I 242.

laws as particular causes, II 40 presents particular causes of the changes of motion as falling under the umbrella of the third law.

Articles II 43 and II 45 describe more precisely what happens when two bodies meet and indicate the ontological status of forces, the causal role they play in the exchange of motions, and how to evaluate them at the moment of collision:

i/ The ontological status of forces

Descartes warns us from the outset that, from an ontological point of view, the force of a moving body does not constitute a kind of ontological supplement that should be added to matter and motion. “We must be very careful to note that the force of any given body to act on, or to resist the action of another body [...] consists simply in the fact that everything tends, so far as it can, to persist in the same state [*unaquaeque res tendat, quantum in se est, ad permanendum in eodem statu in quo est*], according to the first law.”⁴⁶ Body A is said to possess a certain force from the point of view of another body B,⁴⁷ when they meet so that the motion of A could modify the motion of B; but if, forgetting B, we place ourselves in the perspective of A, without considering any other body, its force is nothing but the fact that it perseveres in his state of motion. It is because each body perseveres in its motion that, when it meets another body and only in these circumstances, it can come to have the force to act on it or to resist it. The physical notion of force does not therefore refer to a specific entity: it is only the motion of a body which tends to stay in its state at the moment when it meets another body. It should be noted that the Latin version of article II 40 of *Principia philosophiae* does not mention force, unlike *The World* and the French version of *Principes de la philosophie*.⁴⁸ In this sense, physical forces are nothing more than matter and motion. But this does not prevent them to have a causal role in the exchange of motion.

ii/ The causal role of forces in the exchange of motion

As we have said, the third law specifies the manner in which the exchange of motion between two bodies is realized, depending on the stronger one at the moment when they meet.

⁴⁶ *Principia philosophiae*, II 40, AT VIII 65, CSM I 242. It must be noted that “vis” and “actio” appear often as synonymous in Descartes’ vocabulary, see for example “vis et actio” (AT VII 49), “vim, vel actionem” (*Principia philosophiae* II 25, AT VIII 54), “eadem vis et actio” (*id.*, II 29, AT VIII 55), “vis sive actio” (*id.* III 38, AT VIII 96).

⁴⁷ *Principia philosophiae*, II 25, AT VIII 54: “*Et dico [motum] esse translationem, non vim, vel actionem quae transfert, ut ostendam illum semper esse in mobili, non in movente, quae haec duo non satis accurate solent distingui.*”

⁴⁸ *The World*, AT XI 38, CSM I 93: “each individual part of matter [...], if it has one begun to move, it will always continue with an equal force [*avec une égale force*] until others stop or retard it.” *Principes de la philosophie*, II 40, AT IX 84: “lorsqu’elle a commencé une fois de se mouvoir, nous n’avons aussi aucune raison de penser qu’elle doive jamais cesser de se mouvoir de mesme force; pendant qu’elle ne rencontre rien qui retarde ou arreste son mouvement.”

Article II 45, which introduces the seven rules of motion, insists that the quantitative ratio of forces determines the outcome of this meeting. “To enable us to determine [...] how individual bodies [*singula corpora*] increase or diminish their motions or change direction as a result of a collision with other bodies [*ob aliorum corporum occursus*], all that is necessary is to calculate how much force there is to move or to resist motion [*quantum in unoquoque sit virium, sive ad movendum, sive ad motui resistendum*].”⁴⁹ Therefore, the fact that physical forces are not entities distinct from moving bodies and the fact that they are not efficient causes does not prevent that the instantaneous ratio of the forces in presence when two bodies meet is the cause of something: this ratio causes how bodies exchange motion. Forces are not ontological supplements, but they have a real causal role.

iii/ The evaluation of forces at the moment of collision

The causal role played by the forces of two bodies that meet depends on their respective quantities at the moment of collision. Their evaluation of these quantities must therefore be related to this moment: before and after the collision, there is no force, but only the motion of a body that tends to stay in its state, and therefore there is nothing to evaluate. In fact, Descartes sets up an evaluation of the forces at the moment of the collision, in which the four parameters (magnitude, contact surface, velocity, direction) that intervene catch the ratio between them. “An estimate of this force must depend firstly on the size of the body in question and the size of the surface which separates it from the other body, and secondly on the speed of the motion, and on the nature and contrariety, in which [these] different bodies collide.”⁵⁰

From this examination of articles II 36-45 of the *Principia philosophiae*, two points stand out. In the first place, the tendency of bodies to persist in their state is the supreme law of the Cartesian world. It is according to this law that a body tends to stay in its motion, but also that it resists the changes that other bodies try to impose upon it when they meet. In this sense, this law explains not only the persistence of motions, but also their changes; it explains not only the individual behavior of a body, but also its causal interaction with other bodies. Incidentally, there is perhaps here an explanation of the reason why Descartes sometimes speaks of the three laws of nature as particular and secondary causes (II 37), sometimes only of the third law (II 40): namely the third law is in a sense nothing else than the first. Secondly, and above all, these articles rest on the distinction between, on the one hand, the metaphysical force of God who creates and conserves bodies in motion, and on the other hand, the physical

⁴⁹ *Principia philosophiae*, II 45, AT VIII 67, CSM I 244.

⁵⁰ *Principia philosophiae*, II 43, AT VIII 67, CSM I 244.

forces, which manifest themselves only at moment, when bodies collide. These forces are two different causes that do not operate on the same plane: Descartes says of the first metaphysical causal that it is efficient, I baptized specific the other physical cause.

3. More generally, the deflationist interpretation that I propose is based on the introduction of some space between physics and metaphysics. As we have seen, Schmaltz and Garber apply a principle of compensation according to which what God does not do, the forces do, and vice versa. Such a principle presupposes that metaphysics and physics are on the same plane. If we think about it a little, the concurrentists, even if they do not apply the principle of compensation, do not escape this presupposition: if their problem is to determine how the primary cause and the second causes can concur in producing an effect without overdetermination, it is because they consider that the causal activities of the first cause and of the second causes are on the same plane.

I do not think that it has ever been noticed how the title of Garber's seminal work, *Descartes' Metaphysical Physics*, was both surprising and revealing of Garber's perspective, which set the tone for other interpreters. Descartes himself never speaks of his "metaphysical physics," but of foundations [*fundamenta*] or principles [*principia*] of his philosophy or of its physics.⁵¹ Unlike his Aristotelian professors, he thought indeed not only that metaphysics should precede physics, but also that his physics was founded or supported by his metaphysics.⁵² But this does not make Descartes' physics a "metaphysical physics." Even in part II of the *Principia philosophiae*, one can wonder what exactly the idea that physics is founded on metaphysics actually implies. For sure, the existence of a non-deceiving God allows us to be certain that we know something when we think we know, the distinction of mind and body helps us to establish that the essence of matter is extension; the laws of nature flow from the immutability of God. But, for all that, are physics and metaphysics on the same plane?

⁵¹ See for example, Descartes to Mersenne, April 1634, AT I 287; to Plempius for Fromondus, 3 October 1637, AT I 413, 421, CSM III 63, 64; to Plempius, 15 February 1638, AT I 529, CSM III 83; to Mersenne, 11 November 1640, AT III 233, CSM III 156; to Mersenne, December 1640, AT III 258, CSM III 160; to Charlet, October 1644, AT IV 140-1, CSM III 238

⁵² Descartes to Mersenne, 25 April 1630, AT I 144, CSM III 22: "I would not have been able to discover the foundations of physics, if I had not looked after them along that road [the road of metaphysics]"; Descartes to Gibieuf, 11 November 1640, AT III 233, CSM III 157: "the little book which I sent [the *Meditations*] you contain all the principles of my physics"; Descartes to Mersenne, 28 January 1641, AT III 298, CSM III 173: "these six Meditations contain all the foundations of my physics"; *Principes de la philosophie*, Préface, AT IX 19: "quelques veritez de Metaphysique, sur qui toute la Physique doit estre appuyée."

In this chapter, I suggested that metaphysical causality and physical causality which appear in *Principia philosophiae* are of two different kinds. It may be argued, at least as a plausible hypothesis, that Descartes did not want to place all the discursive regimes on the same plane, but rather to determine what is the proper plane to which each one belongs, and just as well what is the arrangement of these planes with respect to each other. What Descartes says about force as the action of God who creates and conserves is not canceled when he begins to do physics - it remains preserved, but in a metaphysical plane that is not the plane where physics is done.⁵³

If it is true that Descartes instituted some space between metaphysics and physics, there was here a singular equilibrium, which his heirs had difficulty in preserving, whether they were contemporaries of Descartes or are today's historians. Descartes had managed to make opposite positions coexist precisely because he did not situate them all on the same plane; his heirs, because they situated these positions on the same plane, had to make some choices between them. The occasional interpretation of Descartes, starting with Claude Clerselier, Géraud de Cordemoy, Louis de la Forge, Malebranche, up to Garber, is the best known, probably because the canonical history of philosophy favour grandiose systems, even if they go against common sense. But the conservationist interpretation adopted by Schmaltz also existed among the heirs of Descartes.⁵⁴

⁵³ Against the metaphor of chains of reason and via the expression “the space [*espacement*] of truth” that he borrows from Jacques Derrida, Denis Kambouchner, *L'homme des passions. Commentaires sur Descartes* (Paris: Albin Michel, 1995), II 354-5, reaches a similar conclusion concerning the relationships of metaphysics and ethics.

⁵⁴ This would be another paper, but this is clearly the explanation of the two sides of Descartes' reception, which astonishes Hattfield, “Force (God) in Descartes' Physics,” 135-6.