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KNOWING CAUSES: DESCARTES ON THE WORLD OF MATTER[1]

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ABSTRACT

In this essay, we discuss how Descartes arrives at his mature view of material causation. Descartes' position changes over time in some very radical ways. The last section spells out his final position as to how causation works in the world of material objects.

When considering Descartes' causal theories, it is useful to distinguish between 'vertical' and 'horizontal' causation. The vertical perspective addresses God's relation to creation. God is essential being, and every being other than God depends upon God in order to exist and to continue in existence .Thus, from the vertical perspective, the act of creating and fact of coming into existence are co-extensive notions. This metaphysical/theological framework is the basis of Descartes' commitment to three interrelated notions: that genuine causes and effects occur simultaneously; that causing is appropriately the case only when the cause is acting; and the view that God is the efficient, total, and continuous cause of everything that exists and every action that occurs. So from the vertical perspective, things are nothing without God's continuous creation, and there is a problem in articulating how they are said to have independent being and causal efficacy. It is in terms of these commitments that Descartes' views on horizontal, or material, causation must be approached. We will make apparent the radical extent to which his account of intra-worldly causation abandons his earlier and more traditional views about material causation. To this end we discuss Descartes' journey to his mature position by emphasizing the growing epistemic limitations of his philosophy, which culminate in what we call his epistemic stance.

[1] The authors are indebted to Steffen Ducheyne and an anonymous referee for their comments.

1. The Early Descartes

Descartes in the *Rules for the Direction of the Mind* (c. 1628) discusses the dimensions of bodies, which he treats as modes with respect to which some subject is considered measurable. The modes are length, breadth, depth, weight and speed. Modes "[either] have a real basis in the objects themselves [or] […] are arbitrary inventions of our mind" (CSM[2] I: 63; AT X: 448). He goes on: "The weight of a body is something real, so too is the speed of a motion, or the division of a century into years and days; but the division of the day into hours and minutes is not."(CSM I: 63; AT X: 448). He clearly takes speed to have a real basis in existing objects, which entails that motion is real for him at this stage in his thought.

However, earlier in a letter to Beeckman (AT X: 77), Descartes uses a geometrically constructed triangle to represent the proportion between time, space and force. He presents the construction of this diagram in terms of a thought experiment, wherein he assumes that God creates a new force at every moment ("*iamque primum, verba gratia, hodie hora nona Deus creet in b vim attractivam lapiidis, & singulis postea momentis novam & novam vim creet* […]"), which is represented by the construction of a triangle by adding lines, each one in the same measure longer than its precedent. Each line represents the sum of the forces effective in a given moment and created by God in this instant.[3] There is no evidence that, at this stage, Descartes is theologically serious about this model of instantaneous creation. He seems to use the creation talk to make plausible an idea of instantaneous motion. He needs this because at this time Descartes is a realist about motion and aware that motion cannot really exist at a moment. Later, he will make much more of instantaneous creation as he becomes more theologically inclined.

From late 1628 to the early 1630's, Descartes begins to consider metaphysical questions, especially those concerning God and the soul. How these concerns change and affect his conception of bodily motion is the topic to which we now turn.

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[2] NOTE FROM THE EDITOR: for the abbreviations of the scholarly editions of Descartes, please consult the references provided at the end of this essay.

[3] Robert Schnepf pointed out this passage to us.

2. Cartesian Recreationalism

By the time of *The World* (c. 1631), Descartes argues repeatedly that God creates the world to be self-organizing; i.e., the world is set up so that no further Divine action is necessary. Specifically, God instills motion in parts of matter such that it is conserved: "I do not pause to seek the cause of their motions, for it is enough for me to take it that they began to move as soon as the world began to exist. And that being the case, I reason that their motions cannot possibly ever cease, or even change in any way except in respect of their subject" (G: 9; AT VI: 11). The picture is clearly one in which God creates the world and instills motion in it; however, it does not suggest Descartes' later recreationalist view. Again, in chapter five, a picture of enduring creation is implied in which the world naturally evolves to the forms in which we find it: "each part of matter always tends to one of their forms and, once it has been so reduced, never tends to leave that form. Consequently, even if God had created only mixed bodies at the beginning, all bodies would nonetheless have had the chance to shed their forms and take on those of the elements" (G: 19; AT VI: 28).

This view is clearest in chapter six in "the guise of a fable" (G: 21; AT VI: 31). Indications of the view in the treatise, before the fable is introduced, suggest that the fable guise does not undercut Descartes' conviction concerning the 'reality' of the position he is taking. He writes:

> For God has established these laws in such a marvelous way that even if we suppose that He creates nothing more than what I have said, and even if He does not impose any order or proportion on it but makes it of the most confused and muddled chaos that any of the poets could describe, the laws of nature are sufficient to cause the parts of this chaos to disentangle themselves and arrange themselves in such a good order that they will have the form of a most perfect world. (G: 23; AT VI: 34-35)

But Descartes is very clear that each body receives its motion from God: "Let us add further that this matter can be divided into any parts and according to any shapes that we can imagine, and that each of its parts is capable of receiving in itself [*recevoir en soi*] any motions we can also conceive. Let us suppose in addition that God truly divides it into many

such parts […]" (G: 23; AT VI: 34).In chapter seven[4], Descartes elaborates this picture, articulating "the means by which Nature alone is able to untangle the confusion of the chaos which I have been speaking about, and what the Laws of Nature that God has imposed on it are" (G: 25; AT VI: 36).

Descartes is subtle, but clear, in adducing theological support for a conception of natural philosophy that is at odds with his later view of God's ongoing recreation of the world:

> By 'Nature' here I do not mean some deity or other sort of imaginary power. Rather, I use the word to signify matter itself, in so far as I am considering it taken together with the totality of qualities I have attributed to it, and on the condition that God continues to preserve it in the same way that He created it. For it necessarily follows from the mere fact that He continues to preserve it thus that there may be many changes in its parts that cannot, it seems to me, properly be attributed to the action of God, because this action never changes, and which I therefore attribute to Nature. The rules by which these changes take place I call the Laws of Nature. […] There is no one who does not believe that this same rule is observed in the old world, as regards size, shape, rest and a thousand other things. But the Philosophers have exempted motion from it, which is the one thing I most explicitly wish to include. (G: 25; AT VI: 37 & G: 26; AT VI: 38)

There are several noteworthy points in this passage. First, the active powers responsible for the evolution of the material world are placed within matter and follow from its laws. One of the active powers of matter is motion, which continues the view Descartes described in the *Rules* where he says that speed has a basis in bodies. Second, while God preserves matter as He created it, this notion of preservation is not treated as active in the recreationalist sense Descartes develops in later writings. Third, since God's preservation is His action, and God's action is unchanging, the specific changes in the world's configurations cannot be attributed to that action, but instead are attributed Nature's action, that

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[4] Under the original (1664) heading of "By what Laws and by what Means the Parts of this World will extricate themselves, by themselves, from the Chaos and Confusion they were in".

is to say, to matter and its parts following nature's laws. This is a clear commitment to secondary causation in nature itself.

In the next paragraph, Descartes continues, and speaks specifically about matter and motion in the world:

> If God always acts in the same way and consequently always produces substantially the same effect, many differences in this effect occur, as if by accident. And it is *easy to accept* that God, who is, as everyone must know, immutable, always acts in the same way. (G: 25; AT VI: 37-38; italics added)

Although he indicates that God's preservation is action, that action does not account for specific changes in the world. God's action is immutable; but the world is ever changing. What is most interesting about these passages is not simply that Descartes as yet does not hold a recreationalist picture, or that he is implicitly denying recreationalism as he would later hold it. It is that he takes his position to be "easy to accept" on the basis of God's immutability which he considers to be standard theological doctrine.

Descartes moves directly from the passage above to laying out "two or three principal rules by which we must believe God to cause the nature of this new world to act" (G: 25; AT VI: 38). That this follows immediately after, and is in accord with the "metaphysical considerations" (G: 25; AT VI: 38) above, indicates that Descartes' belief is more than just hypothetical. On the contrary, he really holds that God causes the world to act in accordance with these principles but, most significantly, that the action itself is in the world. A little later, Descartes writes:

> These two rules follow manifestly from the sole fact that God is immutable and that, acting always in the same way, He produces the same effect. For on the assumption that he placed a certain amount of motion in matter in general at the first instant he created it, we must admit either he preserves the same amount of motion in it, or not believe he always acts in the same way. (G: 29-30; AT VI: 43)

In articulating the third law (cf. the second law in the *Principles*), Descartes shifts the application of the conservation principle to the

motion of individual parts of matter. Each part of matter's motion "depends solely on God's conserving everything by a ongoing action [*par une action continue*], and consequently on His conserving it not as it may have been some time earlier but precisely as it is at the very instant He conserves it" (G: 29-30; AT: VI 44). This law is potentially at odds with the self-organizing nature of the world, in that the cause of motion for each part of matter is ascribed directly to God's instantaneous action rather than being inscribed in the world itself. Yet in the same paragraph he goes on:"I do not say that rectilinear motion can take place in an instant, but only that all that is required to produce it is found in bodies [*se trouve dans les corps*] in each instant." (G: 30; AT VI: 45). Descartes elaborates: "According to this rule, then, we must say that God alone is the author of all the motions in the world in so far as they exist and in so far as they are straight, but that it is the various dispositions of matter that render the motions irregular and curved." (G: 30; AT VI: 46-47). Here, God is the direct cause of the straight-line motions which occur in the world by placing His action in the bodies themselves as their tendency to motion. This is in addition to the sense of conserving, *via* his immutability, the total quantity of motion in all the parts taken as a whole. On this reading, the only changes occurring in the world is that the parts of matter change directions but the quantity of motion in each part remains the same. The non-linear irregularities of motion are explained by "various dispositions of matter", which are secondary horizontal causes.

Descartes had worked out this division between motion and its determination (or directional component) in the *Optics*, finished around the time of his early work on *The World*, perhaps as early as 1630, but no later than 1632 (CSM I: 109-110). Specifically, Descartes tells us that "the power, whatever it be, which causes the movement is different from that which determines it to move in one direction rather than in another." (O: 75; AT VI: 94). The separation of movement (and its cause) from its determination of direction gives Descartes a way of explaining reflection, since the quantity of motion of a particle impinging on a mirrored surface remains constant, as at the same time the directionality reverses itself upon impact (*Optics, Second Discourse,* O: 75-77; AT VI: 93-96).

The World introduces us to two senses of conservation (quantity of motion in matter as a whole and straight-line motion in the parts) and to two commitments: (1) that the nature of material bodies is *in* the body

itself, and (2) that a body's motion at any moment is directly attributable to God. The latter is said to be instantaneous. None of these positions, however, entails anything about a recreationalist theory. Yet, there is an unresolved tension in *The World* between the view that God's preservation is detached and the view that His conservation is on-going and active. We will argue that this tension is gradually resolved in Descartes' subsequent works as he begins to take more seriously the instantaneous character of God's action in the world. But apparently, at this stage in his thinking, Descartes sees no problem in holding these different positions.

A note on chronology is in order here. Descartes indicates in a 1629 letter to Mersenne that he has started to work on explaining "all the phenomena of nature […] the whole of physics." (CSM III: 7; AT: I 70). He is referring to *The World.* In a letter to Mersenne in November 1633, Descartes indicates that he will temporarily suppress his *World* after learning of Galileo's condemnation. In the light of this chronology, 1629-1633 is the period typically given in which Descartes is at work on *The World.* Nonetheless, as late as October 5, 1637 Descartes writes to Constantijn Huygens that his work on mechanics "takes up so much time that I have resolved to concentrate on this alone; I have even laid aside all work on my *World*, so that I shall not be tempted to put the finishing touches to it." (CSM III: 66; AT I: 434).The implication is that Descartes did not stop working on *The World* in 1633, but continues until at least 1638.As such, the differences we find in *The World* might reflect different periods of composition and indicate that his request for objections (cf. letter to Mersenne, April 15, 1630; CSM III: 23; AT I: 146) had been answered. Furthermore, although there are recreationalist views in the literature of which Descartes would be aware of (see Hattab, 1998), the time frame of his shift indicates, more proximately, the influence of direct contemporaries, such as Jean de Silhon and Jean-Baptiste Morin.[5]

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[5] Jean de Silhon is one of the Parisian theologians who prominently argues for a form of recreationalism during the period of Descartes' request for objections. Richard Watson notes that "Descartes knew Silhon in Paris from 1626 to 1628, and they wrote to one another after Descartes moved to the United Provinces" (2002: 201). Given these connections it would be surprising if Descartes was not at least familiar with the opinions Silhon expresses in his 1626 work, *The Two*

Whatever tensions we find in *The World*, we must not overlook the fact that Descartes still holds, in 1637, a realist view about motion to the effect that it is an active property in material bodies. When he publishes his *Discourse and Essays*, in 1637, Descartes has already shifted into a more metaphysical way of thinking in line with theological orthodoxy.

Truths, by the period of the early to mid 1630s. In that work, Silhon argues that creation and conservation "are measured by the same criterion, and there is no difference, either for the cause, or for the effect, except insofar as creation concerns the first moment in which something has being" (1998: 185).Conservation is the "continuation of creation" and "occurs by the same force and the same effect" (ibid.: 186). God is the cause of the world, both its initial creation and its continuation such that "what God draws purely out of nothing, and without the concurrence of any subject, he also conserves, without the concurrence of any subject" (ibid.).

At the same time, God never denies his concurrence "when it is needed by secondary causes" (ibid.).Here, Silhon begins to speak of secondary causation while recognizing that the primary cause is God's continual recreation. God "allows several causes auxiliary to his power in the production of various effects, and the influence of the same causes always accompanies his own in the conservation of some of them" (ibid.: 190).While Silhon's work suggests God's active, ongoing creation of the world, in allowing for secondary causes in nature it does not suggest the far-reaching implications of Descartes' shift to recreationalism.

Descartes is also known to have read Jean-Baptiste Morin's 1635 work *Quod Deus Sit*, writing of his disappointment with it in a January 1641 letter to Mersenne (CSM III: 171-172; AT III: 287-291). In Theorem 22 Morin writes: "Since a finite being is produced by an act of will of the infinite Being (Theorem 21), it exists only insofar as the infinite Being wills this to be so. But as long as an infinite Being wills a finite being to exist, so long does it continue to produce it, since the omnipotent will of an infinite Being is supremely efficacious (theorem 21).Hence, a finite being produced by an infinite Being is continually produced by the same infinite Being. This continuous production of a finite being is generally called its 'conservation' by the infinite Being, and if it ceased, the finite being would forthwith cease to exist." (ibid.: 144)In Theorem 23, Morin is especially clear on the implications of this view, stressing primary causation over secondary: "Hence, all the real effects of a finite being are brought about by the efficient and immediate concurrence of the infinite Being" (ibid.: 145).The acceptance of both primary and secondary causes found in Silhon is challenged in Morin's work, the "real effects" resting on the primary cause.

So in *Discourse on Method*, he introduces the mind-body distinction and the *cogito* argument, but he also begins to rework his ideas on the nature of matter and motion.

In the *Discourse*, Descartes writes that he had "tried to explain the principles of these truths in a treatise which certain considerations prevent me from publishing, I know no better way to make them known than by summarizing its contents here" (O: 34; AT VI: 41).Not surprisingly, he reproduces aspects of his pre-recreationalist views from *The World*. He writes of "certain laws which God has established in nature" (O: 34; AT VI: 41) and articulates them under the guise of a fable:

> I even resolved to leave this whole world to their disputes, and to speak only of what would happen in a new world, if God were now to create somewhere, in imaginary space, enough matter to compose it, and if He agitated the parts of this matter diversely and without order, so that He made of it a chaos as confused as the poets can imagine, and if afterwards He did nothing else except lend His ordinary support to nature, and left it to act according to the laws which he established. (O: 35; AT VI: 42)

This corresponds with the "detached support" manner of understanding conservation articulated in *The World*. This is not surprising, since it's a summary of his *World*. While God's "support" is necessary for the world's continuation, once created, nature can act alone according to its laws. In the same work, however, we also find the following statement: "But it is certain – *and this is a commonly accepted opinion among theologians* – that the action by which God now conserves it [the world] is the same as that by which He created it […]" (O: 37; AT VI: 45; italics added).In this passage, for the first time, Descartes clearly equates creation and conservation, a view integral to his mature doctrine of recreationalism. Nonetheless, the passage goes on once again to stress the self-organizing nature of the world, and the equation of creation and conservation is restricted to God's detached governance of the material world, i.e., Nature following the laws He has established.

However, a connection between God's ongoing creative action and the implications of a self-organizing world is not worked out. Descartes still locates causality and motion in the world and gives various statements of the causal powers of matter. For instance, he speaks of

"demonstrating the effects through causes, and showing from what sources and in what way nature must produce them" (O: 37; AT VI: 45). He also speaks of "certain laws which God has established in nature" corresponding with notions "he has imprinted […] in our souls" (O: 34; AT VI: 41).We need to note that the epistemic part of this passage concerns our ability to know nature's established laws, and does not yet reflect the epistemic turn which will be concerned the very nature of the laws themselves.

As late as 1640 Descartes is still a realist about motion. He holds that God creates motion in bodies, but once created the bodies move on their own. Indeed, Descartes comments on this to Mersenne in reference to a letter he had received from one friar Blaye:"He is right in saying that it is a mistake to accept the principle that no body moves of itself. For it is certain that a body, once it has begun to move, has in itself for that reason alone the power to continue to move, just as once it is stationary in a certain place, it has for that reason alone the power to continue to remain there." (Letter to Mersenne, 28 October 1640; K: 79; AT III: 205).

However, after publication of the *Discourse*, Descartes begins to think about and work on his *Meditations*, which he intends as a sustained metaphysical answer to his critics (cf. Letter to [Vatier], 22 February 1638; CSM III: 85-86; AT I: 560).This metaphysical musing seems to have led him back to the idea of instantaneous creation, and probably recalled him to his brief flirtation with creation moment by moment (which we saw as part of his geometrical model in his early work with Beeckman).It is this idea that he begins to work out in the *Meditations*.

In *Meditation* III, we see the first solid use of recreationalism by Descartes in promoting his program. Here, he uses the principle that preservation requires the same power as creation (resting this on an argument from the nature of time rather than on received opinion) to give an argument for the existence of God:

> For a lifespan can be divided into countless parts, *each completely independent of the others*, so that it does not follow from the fact that I existed a little while ago that I must exist now, unless there is some cause which as it were creates me afresh at this moment – that is, which preserves me. For it is quite clear to anyone who attentively considers the nature of time that *the same power and action are needed to preserve anything at each individual moment*

> *of its duration as would be required to create that thing anew* if it were not yet in existence. Hence the distinction between preservation and creation is only a conceptual one. (CSM II: 33; AT VII: 48-49; italics added)

While the equation of conservation and creation is present in the *Discourse*, its connection to the independence of the parts of time and its relation to the *cogito* is not worked out. In the *Discourse* the connection is unclear. The earlier version reads: "there is nothing at all in this proposition I think, therefore I am which assures me that I speak the truth, except that I see very clearly that in order to think, it is necessary to be" (O: 28; AT VII: 33). In the *Meditations* this is expressed in a more temporal manner – "this proposition, *I am, I exist*, is necessarily true *whenever* it is put forward by me or conceived in my mind" (CSM II: 17; AT VII: 25; italics added). Here the thrust of the *cogito* is temporally circumscribed, and it reflects Descartes' concern for what may be grasped *in* a moment and for the idea that time has individual moments.

The point of Descartes' 'lifespan' argument is that the duration of his existence lies in God's action in recreating him from moment to moment. At this point in *Meditation* III, Descartes is a disembodied thinker, and the *cogito* is now tied to time. In other words, Descartes' existence is assured at each moment in which he thinks. But he has yet to establish that he has the power to continue thinking or that he will always continue to think. Moreover, the lifespan argument invokes the notion that causing is appropriately the case only at the moment when the cause is acting. This is the beginning of Descartes' full blown recreationalist picture, and it is intrinsically bound to the doctrine that the parts of time are *causally* independent of one another. The parts of time need not be atomic, but can be considered to be small as one pleases, like the moments or instants that he had used in constructing the diagram for Beeckman many years back.

Nonetheless, the consequences of this notion are only beginning to permeate Descartes' philosophy at this time. In the *Fifth Reply* to Gassendi, Descartes expands the line of thought of *Meditation* III, suggesting two levels of causation that will continue to mark his thinking:

> When you deny that *in order to be conserved, we need the continual [continuo] influx [action] of the first cause*, you are

> disputing something which all metaphysicians affirm as a manifest truth. […] This can be plainly demonstrated from my explanation of the independence of the divisions of time. You try in vain to evade my argument by talking of the necessary 'connection' which exists between the divisions of time considered in the abstract. But this is not the issue: we are considering the time or duration of the thing which endures, and here you would not deny that the individual moments can be separated from those immediately preceding and succeeding them, which implies that the thing which endures may cease to be at any given moment. (CSM II: 254-255; AT VII: 369-370)

Gassendi's objection to Descartes' claim "that the parts of your lifetime are 'independent of each other'" is that it is difficult to "think of anything whose parts are more inseparable from one another than your duration" (CSM II: 209; AT VII: 301).Of course, this is true; the orderliness of the world necessitates a "connection" between the parts of time. Descartes does not question this; instead he raises doubts about the nature of the connection. For Descartes the observed order of nature is now the orderliness of God's action in recreation, rather than the action of causal powers within the created world. The independence of the parts of time entails that the world's future states are no longer contained intrinsically in the world itself.

3. Still Active Powers

Yet a realist position concerning motion is still present in the *Meditations* (1641). The structure of the causal realist argument in *Meditation* VI rests on the traditional notion of productive causation in the created world: an effect's reality derives from its cause, and the cause must possess at least as much reality as the effect produced by that cause. Here is the causal realist argument in full:

> Now there is in me a passive faculty of sensory perception, that is, a faculty for receiving and recognizing the ideas of sensible objects; but I could not make use of it unless there was also something active [*quaedam activa*], either in me or in something else, which has produced [*producendi*] or brought about [*efficiendi*] these ideas. But this faculty cannot be in me, since

> clearly it presupposes no intellectual act on my part, and the ideas in question are produced [*producuntur*] without my cooperation and often even against my will. So the only alternative is that it is in another substance distinct from me–a substance which contains either formally or eminently all the reality which exists objectively in the ideas produced [*productis*] by this faculty (as I have just noted). This substance is either a body, that is, a corporeal nature, in which case it will contain formally everything which is to be found objectively in the ideas; or else it is God, or some creature more noble than a body, in which case it will contain eminently whatever is to be found in the ideas. But since God is not a deceiver, it is completely obvious that he does not transmit [*immittere*] these ideas immediately and through himself, nor even with the help of some creature in which their objective reality is contained not formally but only eminently. For God has plainly given me no faculty at all for recognizing any such source for these ideas; on the contrary, he has given me a great propensity to believe that they are transmitted [*emitti*] by corporeal things. So I do not see how God could be understood to be anything but a deceiver if the ideas were transmitted [*emitterentur*] from a source other than corporeal things. Thus, corporeal things exist. They may not exist in a way that exactly comports [*comprehendo*] with my sensory grasp of them, for in many cases the grasp of the senses is very obscure and confused. But at least they possess all the properties which I clearly and distinctly understand [*intelligo*], that is, all those which, viewed in general terms, are comprised within the subject-matter of pure mathematics. (CSM II: 55; AT VII: 79-80)

How are we to understand Descartes' reference to "something active" residing in bodies external to him which produces in him ideas of sensible things, if, as every commentator assumes, such bodies are essentially only passive extension? And how do we explain that Descartes no longer refers to "something active" in the variant of the argument which appears in the Latin *Principles of Philosophy* of 1644, and in its French translation of 1647 (II.1; CSM I: 221; AT VIII-I: 40-41; AT IX-2: 63-4)?

To get an initial feel for Descartes' epistemic shift, as it plays out in his metaphysics of matter, let's look at what he says just about the time he begins working on his textbook, *Principles of Philosophy* (*Principia Philosophiae.*)In 1643, he writes to Mersenne:

> I do not believe there are in nature any real qualities, attached to substances and separable from them by divine power like so many little souls in their bodies.Motion, and all other modifications of substance which are called qualities, have not greater reality, on my view, than is commonly attributed by philosophers to shape, which they call only a mode and not a real quality [...] I do not see that the human mind has any notion, or particular idea to conceive them by; so that when we talk about them and assert their existence we are asserting something we do not conceive, and doing something we do not understand...Since motion is not a real quality but only a mode, it can only be conceived as the change by which a body leaves the vicinity of some others. (26 April 1643; K: 135-6; AT III: 648)

This is the first occurrence we have found of Descartes' rejection of the doctrine of accidents and real qualities in favor of an ontology of modes. What is most significant here, is his concomitant shift away from motion conceived as a property inherent in bodies themselves to motion conceived simply as a relational mode, i.e., as a transference of a body from the vicinity (of some bodies) to another. These new notions will become central to the ontology of the *Principles*.

4. Mature Motion

In the *Principles of Philosophy* (1644) Descartes makes clear his commitment to God's active power. In discussing the principles of material objects (the title of Part II) he is unequivocal about God's causal role:

> 36.That God is the primary cause of motion; and that He always maintains an equal quantity of it in the universe.
> After having examined the nature of motion, we must consider its cause, which is twofold: the universal and primary one, which is the general cause of all movements in the world; and then the particular ones, by which the individual parts of matter acquire movements which they did not previously have. As far as the general cause is concerned, it seems obvious to me that this is none other than God himself, who in the beginning created matter with both movement and rest; and now maintains in the sum total of

> matter, by his ordinary concourse [*concursum ordinarium*], the same quantity of motion and rest that he placed in it at that time. For although motion is only a mode of the matter which is moved, nonetheless there is a fixed and determined quantity of it... We understand that it is one of God's perfections not only to be immutable in His nature, but also immutable and completely constant in the way he acts [*operetur*]. (II.36; M: 57-8; AT VIII-1: 61)

This passage deserves careful scrutiny, for it contains most of Descartes' mature views of matter in relation to Divine causation. When fully elucidated it ties back to Descartes' version of continual recreationalism.

Descartes describes God as the primary, universal and general cause of motion. But motion belongs only to the parts of matter and not to the whole. He has said earlier in Part II that matter is a plenum (II.16-23; M: 46-50; AT VIII-1: 49-53), so that the material world, conceived generally, is one body. Yet he says that the identity of the parts of matter and all their properties, "all the variation of matter, or all the diversity of forms, depends on motion." (II.23; M: 50; AT VIII-1: 52-53). There is a serious problem, for Descartes, in regard to individuating the parts of matter by means of these internal motions conceived only as modes of matter, and we shall comment on this later (see Anderson, 1976; Slowik, 2000).

By His ordinary concourse, God maintains in the whole of matter the same quantity of motion and rest however it is distributed among the parts. Since God's causal action is with regard to the general, he continually recreates the world at each moment so that there are no changes in the quantity of motion as a whole. If this were not the case, God would be inconstant, mutable. Notice two points: first, God acts in the same way at each moment in which he creates/conserves; second, as will be explained later, in the *Principles* Divine immutability and conservation are important to human welfare only insofar as they are related to the needs of human knowledge.

Next Descartes tells us that "motion is only a mode of matter". This is a major change. As we have noted, up to the period of the *Meditations* Descartes takes motion to be a fundamental property of bodies, one that is on a par with extension.But early in *Principles* II, he writes that “sensory perceptions tell us of the benefit or harm that external bodies may do to this combination [human body and mind], and

do not, except occasionally and accidentally show us what external bodies are like in themselves." (II.3; CSM I: 224; AT VIII-1: 41-42). This is a crucial and elaborated extension of the teleologically limited epistemic position (epistemic teleology) he lays out in *Meditation* VI. There he argues that our sensations of the created world are ultimately provided to us for benefit of human life, since the world and us, as embodied agents, are one and complementary under Divine guidance (CSM II: 55-6; AT VII: 80). Thus, if we critically examine the teachings of nature, we can knowingly find our way around in the world and establish what is cognitively beneficial for us. We will see in detail below how this human teleological perspective is developed in the *Principles* into a general account of how it is that the world is such that we can make cognitive sense of it. It's from this perspective that we need to understand Descartes' claim in *Principles* II that by the intellect's use alone, "we shall perceive that the nature of matter, or body considered in general, consists not in being something which is hard, heavy, colored, or which affects the senses in any way, but simply in being something which is extended in length, breadth and depth" (II.4; M: 40; AT VIII-1: 42). Having extension alone as its principal attribute, we may infer that matter is passive and inert. Moreover, having now rejected motion as a proper property of bodies, they have no power or force that is part of what they are. *Per se*, by their general nature, bodies can cause nothing. Descartes is now forced to provide a new definition of motion.

To elaborate this, Descartes first defines space or internal place: "Nor in fact does space, or internal place, differ from the corporeal substance contained in it, except in the way in which we are accustomed to conceive of it. For in fact the extension is length breadth and depth which constitutes the space occupied by the body, is exactly the same as that which constitutes the body" (I.10; M: 43; AT VIII-1: 9). So the body and the space it occupies are the same thing; the difference lies in the epistemic stance *we* take towards them. But we need another definition in order to talk about a body's changing place. For this Descartes introduces the idea of "external place" or place externally defined by other bodies outside the body whose place we seek:

> For in fact the names 'place' or 'space' do not signify anything different from the body which is said to be in the place: but only designate its size, shape, and situation among other bodies.

> Moreover, in order to determine that situation we must take into account some other bodies which we consider to be motionless: and, depending on which bodies we consider, we can say that the same thing simultaneously changes and does not change its place. Thus, when a ship is heading out to sea, a person seated in the stern always remains in one place as far as the parts of the ship are concerned, for he maintains the same situation in relation to them. But this same person is constantly changing his place as far as the shores are concerned, since he is constantly moving away from some and towards others. Further more, if we think that the earth moves [and is rotating on its axis], and travels from the West toward the East exactly as far as the ship progresses from the East toward the West; we shall once again say that the person seated in the stern does not change his place: because of course we shall determine his place by certain supposedly motionless points in the heavens. Finally, if we think that no truly motionless points of this kind are to be found in the universe, as we will later be shown to be probable; then from that, we shall conclude that nothing has an enduring [fixed and determinate] place, except insofar as its place is determined in our minds. (II.13; M: 45; AT VIII-1: 47)

Later he adds:

> [...] we understand by 'surface' the common surface which is not part of one body more than of the other, and which is thought to be always the same provided that it retains the same size and shape. For even if the whole surrounding body, with its surface, is changed; we do not on that account judge that the surrounding thing changes its place if it maintains the same situation among those external bodies which we consider to be at rest. (II.15; M: 46; AT VIII-1: 48)

Now it is important to notice the character of an epistemic stance that comes to the fore in Descartes' articulation of place and space. He continually says "as we conceive", "which we consider," "by which we determine", etc. And in *Principles* II, section 13, he invokes the perceived relativity of motion made famous previously by Galileo's *Dialogues on the Two Chief World Systems* (1632). He even uses the same boat analogy to make his point.

Descartes mature definition of motion or movement indicates an important turn in his thinking:

> If, however, we consider what should be understood by movement, according to the truth of the matter rather than in accordance with common usage (in order to attribute a determinate nature to it): we can say that it is the transference of one part of matter or of one body, from the vicinity of those bodies immediately contiguous to it and considered as at rest, into the vicinity of [some] others. By one body, or one part of matter, I here understand everything which is simultaneously transported; even though this may be composed of many parts which have other movements among themselves. I also say that it is a transference, not the force or action which transfers, in order to show that this motion is always in the moving body and not in the thing that moves it (because it is not usual to distinguish between these two with sufficient care); and in order to show that it is only a mode [of the moving body], and not a substance, just as shape is a mode of the thing shaped, and rest, of the thing which is at rest. (II.25; M: 51; AT VIII-1: 53-4)

It is clear that motion for Descartes consists in change of relational place, i.e., the transference of a body. It is the positioning of a part of matter, or individual body, relative to the bodies that immediately surround it. These surrounding bodies are considered at rest. As he says later: "I have stated that this transference is effected from the vicinity, not of any contiguous bodies, but only those which we consider to be at rest. For transference is reciprocal. And that exactly the same force and action is required for one transference as for the other." (II.29; M: 53, AT VIII-1: 55-56).

Motion is not conceived as an action or force that causes transference. To attribute force to matter would be to claim that matter has active properties. As he said above, motion refers to the transference, not to the force or action. So why this new reference to “force and action”? It can refer only to God's action. God is the only general cause of motion with regard to matter[6] that Descartes has developed by the time of the *Principles*. But Descartes wants to legitimate, in a secondary sense, terms like “force”, “impulse”, “tendency”, or “inclination” because this is how the ordinary people speak about such matters, and Descartes does not want to depart too far from ordinary speech when

[6] Of course, mind can move matter, but this is not relevant to our concern here.

explaining how the material world works. So in *Principles* II, section 30, he writes:

> [...] if we wished to characterize motion strictly in terms of its own nature, without reference to anything else, then in the case of two contiguous bodies being transferred in opposite directions, and thus separated, we should say that there is just as much motion in the one body as in the other. But this would clash too much with our ordinary way of speaking. (II.30; M: 54; AT VIII-1: 56-57)

The epistemic qualifier concerning what is considered to be in motion or at rest is important because in Descartes' plenum, in the actual world, everything is in motion, nothing at rest. So we cannot require bodies to move relative to things really at rest as a condition for thinking or talking coherently about motion. Again Descartes' epistemic perspective is paramount. We attribute motion to one body rather than another, even though this is not really correct. The standard manner of speaking has it that "movement [...], as customarily interpreted, is nothing other than the action by which some body travels from one place to another" (II.24; M: 50; AT VIII-1: 53). But this is incorrect too, as Descartes makes abundantly clear. Presumably we must speak like the vulgar, but think like the philosopher. So we can speak about action, if we wish, or about one body having all the motion; this is a necessary condition for communication among people. However, philosophically, we should not be fooled. From the philosophical perspective we must realize that such speech is only a *façon de parler*.

This possibility of speaking with the people is most important to Descartes, for he uses this commitment, along with the principle of relational motion, to try to avoid Galileo's "error" about Copernicanism. In *Principles* III, section 28, Descartes argues:

> 28. That the Earth properly speaking, is not moved, nor are any of the Planets; although they are carried along by the heaven.
> And it is important to remember here what was said earlier concerning the nature of movement; i.e., that (if we are speaking properly and in accordance with the truth of the matter) it is only the transference of the body from the vicinity of those bodies which are immediately contiguous to it. And considered to be at rest, into the vicinity of others. However, in common usage, all

> action by which anybody travels from one place to another is also called movement; and in this sense of the term it can be said that the same thing is simultaneously moved and not moved, according to the way in which we diversely determine its location, From this it follows that no movement, in the strict sense, is found in the Earth or even in the other planets; because they are not transported from the parts of the heaven immediately contiguous to them. (III.28; M: 94; AT VIII: 90)

Saving himself from the Copernican heresy, for which Galileo was condemned in 1633, is a big motivation for Descartes. Establishing a relational way of handling motion allowed him to publish, with what he thought was impunity, the *Principles of Philosophy*. However, it should also be clear by this point that the principle of relational motion is not simply dictated by fear of persecution. It is also the only definition of motion available to Descartes given his view that matter is passive extension and lacks intrinsically any causal or active principles. Conceived as passive extension matter comes to the fore in Descartes' doctrine of Creation, understood as instantaneous, continual creation, or divine recreationalism. This is because matter's passivity is the ontic counterpart necessary for explaining the Divinely caused, yet perceptible, activity in matter (such as motion) as it is exercised over time.

We now have to describe more fully the implications of Descartes' thinking concerning motion. Specifically, how is God's action to be understood in regard to motion considered as transference; and what is the role of secondary causes, i.e., the positions of other bits of matter, specifically those that surround the body under immediate consideration?

The distinction between the movement and the tendency or inclination to move (which we first saw in the *Optics* and in the *The World*) is the difference between the actual path of movement a body takes and its tendency at each moment to move in a straight line.[7] We have to remember, however, that in the *Principles* this inclination talk is no longer about real motion: rather, it refers to a straight line tendency or inclination to move that is Descartes' conception of natural motion.He repeats it clearly in *Principles* II, section 39, as his second law of nature:

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[7] Garber thinks he gets this straight line motion from his early time with Beeckman.

> The second law of nature: that all movement is, of itself, along straight lines; and consequently, bodies which are moving in a circle always tend to move away from the center of the circle which they are describing. (II.39; M: 60; AT VIII-1: 63)

Descartes describes this law further, saying "each part of matter, considered individually, tends to movement only along a straight-line even though many of these parts are frequently forced to move aside because they encounter others in their path" (II.39; M: 60; AT VIII-1: 63). He explains that this tendency is due to the "immutability and simplicity of the operation by which God maintains movement in matter".In the first law of nature, Descartes proscribes "that each thing, as far as is in it [*quantum in se est*], always remains in the same state" (II 37; M: 59; AT VIII-1: 62). This he takes to follow from the principle of Divine immutability to which he refers in talking of God as the primary cause of motion (see above):

> […] from this same immutability of God, we can obtain knowledge of the rules or laws of nature, which are secondary and particular causes of the diverse movements which we noticed in individual bodies. The first of these laws is that each thing, provided it is simple and undivided, always remains in the same state as far as is in itself (*quantum in se est*), and never changes except by external causes. (II.37; M: 59; AT VIII-1: 62)

It is important to notice that the laws of nature are designed to function for epistemic purposes. The immutability of God allows humans to obtain knowledge. This reflects a turn in Descartes' thinking which differs from how he describes the intrinsically real powers underlying physical laws in *The World*.

As we noted above epistemic teleology, or the doctrine that what counts as human knowledge is limited to what functions for the preservation of the mind/body union, was first adumbrated in *Meditation* VI. But the *Meditation* doctrine is emphasized and generalized explicitly in *Principles* II, section 3: "The perception of our senses do not teach us what really exists in things, but only what can harm or benefit that [mind-body] union." (II.3; M: 40; AT VIII-1: 41-42). The overarching point here is that humans are able to know the material world, but only in restricted ways. God is no deceiver, but this does not mean that we are

allowed to know everything. There are many features of the world (even of the material world), and also features of God, that are not cognitively open to us, features which our minds cannot grasp. But we may know nature's laws, and thereby come to understand the things we need to know about the world. In other words, with hard work, we may come to have science. But we may do so only if we proceed from firm epistemic foundations. The foundations, of course, are those of the epistemic enterprise that Descartes develops dialectically in the *Mediations*. Yet the main difference, between the *Meditations* and the *Principles*, lies in the shift from talking about what is caused by real activities in nature (known truly by the natural light) to the latter's epistemic stance where what we may know of reality is epistemically limited, though reality is still grounded in the way that God creates the material world.

Another aspect of this epistemic perspective is brought out if we re-consider Descartes' commitment to the causal independence of the parts of time. In the *Second Reply* he generalizes the lifespan argument to include material bodies. "The separate divisions of time do not depend upon each other; hence the fact that the body in question is supposed to have existed up to now 'from itself', that is, without a cause, is not sufficient to make it continue to exist in the future, unless there is some power in it that as it were recreates it continuously." (CSM II: 79; AT VII: 110). In the *Principles*, he continues to generalize the argument to include all human beings:

> And nothing can obscure the clarity of this proof, at least if we consider the nature of time or of the duration of things; which is such that its parts do not depend upon one another, or even exist simultaneously; and that, accordingly, from the fact that we now exist, it does not follow that we shall also exist a moment from now, unless some cause (that is, the same one as that which first produced us) continually produces us, as it were, anew; that is, conserves us. (I.21; M: 11; AT VIII-1: 13)

This re-write of the lifespan argument from the *Meditations* now applies to *we* (to all humans) and not just to *me* and my moment of thinking. These considerations occur within Descartes' program of doubt, indicating that he is aware of how the causal independence of the parts of time, since it applies to all created things, deepens the problems of the relation between human minds and the material world. Specifically,

Descartes now recognizes that even as he builds back up from the doubt that culminates in the *cogito*, severe limits are placed on what we can know about the world. Given that God is infinite, we cannot speak knowledgeably about His reasons for action, but must content ourselves with the cognitive ability He has given us to understand the order He creates:

> Concerning natural things, we shall not undertake any reasonings from the end which God or nature set Himself in creating these things, {and we shall entirely reject from our Philosophy the search for final causes}: because we ought not to presume so much of ourselves as to think that we are the confidants of His intentions. But, considering Him as the efficient cause of all things, we shall see what the natural enlightenment with which He endowed us reveals must be concluded (concerning those of His effects which appear to our senses), from those of His attributes of which He willed that we should have some notion. (I.28; M: 14; AT VIII: 15-16)

One of the conclusions Descartes tries to establish is that "it is one of God's perfections not only to be immutable in His nature, but also immutable and completely constant in the way He acts" (II.36; M: 58; AT VIII-1: 61). This passage marks a subtle, but critical, shift from the immutability considerations in *The World*. There, Descartes' main emphasis is on the connection between God's immutability and straight line motion. But the more general view is that since God's "action never changes" His immutability entails that many changes in the world cannot "properly be attributed to the action of God" (G: 25; AT VI: 37).[8]Furthermore, God's immutable actions indicate a real distinction between primary and secondary causation. But for the Descartes of the *Principles*, the immutability of God's way of acting is reflected in the constancy of the laws of nature which are our formulation of how we understand the way God acts.In parallel with the shift from secondary to primary causation, the laws of nature shift from being intrinsically part of

[8] While Descartes followed this by stating that God "always acts in the same way" (G: 25; AT VI: 8), the stress remained on the constancy of God's action; particular changes are not attributed to God, but come about "as if by accident" (G: 25; AT VI: 38).

the structure of the world, and thus able to account for specific changes in the world, to a limited, though ontologically grounded, understanding of God's constancy and His way of acting. Underlying this shift is the fact that Descartes has not freed himself, even in the *Meditations,* from the reality of motion and the notion of productive causation. This he has done by the time of the *Principles* and, as we'll see shortly, in that work he conceives the laws of motion as epistemic rules enabling us to comprehend the workings of nature teleologically, for our own epistemic purposes, as part of God's harmonious world. Moreover, the fact that they are part of the Divine plan connects bits of extension by a relation of causation which is stronger than mere association. Consequently, this shift, as we will make clear, allows Descartes to speak of particular causes in the world in a way consistent with God's primary causation: "from this same immutability of God, we can obtain knowledge of the rules or laws of nature, which are the secondary and particular causes of the diverse movements which we notice in individual bodies" (II.37; M: 62; AT VIII-1: 62). It is important to emphasize here that Descartes' point is about our knowledge of particular things in nature.

So it is that Descartes introduces his third law of nature: "If a body collides with another body that is stronger than itself, it loses none of its motion; but if it collides with a weaker body, it loses a quantity of motion equal to that which it imparts to the body" (II.40; CSM I: 242; AT VIII-1: 65). Descartes, as far as we can ascertain, was the first 17th Century natural philosopher to make systematically collisions among bodies the primary model for understanding change in the material world. In this he differs from Galileo who had earlier used the Archimedian simple machines as his model of intelligibility. It seems likely that Descartes decided upon this model in his early discussions with Isaac Beeckman (AT X: 77).

Descartes goes on in *Principles* to elaborate his collision laws in terms of calculational rules for determining "how much motion of a given body is altered by collision with other bodies" (II.45; CSM I: 244; AT VIII-1: 67). He gives seven rules for calculating collisions that he takes to apply given the assumption that there are only two bodies that are perfectly hard and isolated from all surrounding bodies. That is, given the plenum, these rules apply only counterfactually to an isolated two-body system as an idealized case that could never exist. Nonetheless, the rules, as Descartes gives them in the third law and in his two-body

collision rules, though inconsistent, are meant as models by which humans, by way of calculation, may understand how the world works. Ignoring the inconsistency, what picture of causal relations among bodies are we left with? The conservation law allows us to calculate collisions among bodies given a fixed quantity of motion in the two body system. But if we add what Descartes says about determination of direction (reviewed above), then the conservation law plays another, greater epistemic role. The conservation law and the directionality principle allow the possibility of finding a ground for identity among bodies involved in collisions. That is, Descartes implicitly invokes an identity principle according to which we can make sense of the world. Consider a two-body rebound case:

At time t^1, body A is at place P^1, and body B is at place P^2.Places P^1 and P^2 are defined by the surrounding bodies that we consider at that moment and subsequent moments as being at rest. In the ideal case, they are given a place by their distance from one another.

In the next moment (t^2) there is a change with respect to the distance body A is from body B; or with respect to both bodies A and B with respect to some surrounding bodies. At t^2, A and B are touching. They cannot interpenetrate; so they must either stop and rest, move away in one direction together, or rebound from one another.

In the rebound case (t^3), Descartes holds that because they moved towards each other from t^1 to t^2 in straight line, they must reverse their direction determinately in the same straight line away from each other.

Now if God recreates the world at each of these moments, in this case t^1, t^2 and t^3, then what He does is create A and B at each moment in a place different relatively to each other (or to surrounding bodies considered by us to be at rest). We might say there is no "real" movement in the world, but only God's continual recreating of bodies with changes of relative place among them. Yet this transition or change *is* motion for human beings and it does describe how the world "really" is. It is motion according to Descartes' definition of the nature of motion as translation. And its cause is God, in accordance with Descartes' account of the primary cause of motion. Only in this way can the fact that matter has no intrinsic force or impulse be accommodated.

Daniel Garber (1992: 167-72; see also, Des Chene, 2000 and Slowik, 1999) dubs this theory of motion the "cinematic view", which for him amounts to the claim that motion is illusory. But Descartes' motion is not illusory for it is part of a teleological system that allows us to calculate and identify various quantities of motion and to explain causally why bodies that possess them are in these different places at different times. The vertical causal story is God's recreationalism, as we outlined above. The horizontal causal story is given in terms of modes of matter, which are merely modifications of extension, their quantities of motion determined in accordance with the collision laws and the differences between their relative positions at various moments. God's conservation law (and its instantiation in collision rules) is a law that ranges over temporal moments. We know such a law not by experience, but because of the nature of God and the equilibrational harmony by which God works in the world. God has given us the ability to discover these laws of nature through the use of common causal notions. This is why Descartes can give an analytic argument (or as he would say an argument based on the method of exclusion) for the law based on self evident concepts and their definitions. But it is the harmony that is important. The conservation law manifests God's harmony in a teleological way that has as its end allowing humans to make sense of the world by conceiving collisions among bodies as intelligible only in terms of presupposed equilibria (e.g., conserved quantities). In more

Aristotelian terms, in the interest of clarity, the form (quantity) of a body A and the form (quantity) of a body B must maintain a proper proportionality between successive moments of their subsequent existence. It is easy to do this in an isolated two-body system, though even in this case we cannot say which body is really moving. In a multi-body system, we must make assumptions about which bodies are moving and which are taken to be at rest. Even so, if equilibria of this sort are not assumed, there is no way of identifying which bodies are involved in a given collision, and no way to make intelligible how bodies interact one with another.

Of course, as a consequence of Descartes' commitment to recreationalism, we cannot know what "really exists in things". That is, given the causal independence of the parts of time, the changes we observe in the world cannot be actively caused *within* the world since, on this view, the unfolding of the changes would unite the divisions of time. Unlike the view given in *The World*, the thesis of the causal independence of the parts of time commits Descartes to an expanded view of God's action. The early Descartes focuses on laws established in a persistently enduring world (i.e., in the totality of matter) and reduces God's active participation to initial creation and preservation. The late Descartes maximizes God's causal participation in the world and thereby removes *genuinely efficient* and secondary causes from it. What is left is only the geometry of relationships between particular bits of extensions which nonetheless, being natured things, have a basis in the material world.[9] This involves the radical view that matter is identical with continuous extension (II.10; M: 43; AT VIII-1: 45). Every perceivable quality, motion included, has *in rebus* its basis in modes of extension, and therefore is not a *res*. This picture differs from the Scholastic view, according to which certain real qualities are *res*, i.e., entities really distinct from their subjects. This means that for Descartes matter is not an inherently composite structure of prime matter, substantial forms and real qualities.

But is the view of motion we attribute to Descartes a causal view? Yes, indeed! It is causal in the way horizontal causality must work given Descartes' claims about the nature of matter. Remember, as Descartes'

[9] This view is in many ways like that of William of Ockham.

conceives them, efficient causes, so far as they are moving causes, i.e., horizontal causes, pertain to states of things altered through motion and replaced by new states coming to be [*secundum fieri*]. But what is altered are bits of extension "natured" to the extent they can be reconfigured (i.e., changed in direction and speed) through contact, and consequently able to display different sorts of altering spatial arrangements. How does this picture satisfy Descartes' central notion that effects are "derived" from their appropriate causes? We suggest that in contexts where "horizontal" causation is in play, he most likely construes "derivation" as a *sine quibus non* causal relationship: if the cause is posited, the effect follows; if not, it cannot. This view of the causal relationship fits the sparse ontology of extended *res* to which Descartes is committed. So under the collision laws, governed by the conservation of motion, bits of created matter come continually into contact such that their speeds and directions of motion are altered. The *sine quibus non* view chimes with Descartes' statement to Hyperaspistes in 1641 that "[…] all things were nothing until he created them and lent them his concurrence. This does not mean that they should not be called substances, because when we call a created substance self-subsistent we do not rule out divine concurrence which it needs to subsist. We mean only that it is a substance of a kind to exist without any other existent; and this is something that cannot be said of the modes of things […]" (CSM III: 189-90; AT III: 425). This letter is from the period in which Descartes' makes his replies to the critics of the *Meditations*. At this point he has generalized the notion of the causal independence of the parts of time, from the first person case of *Meditation* III, to apply to all existents both animate and inanimate. Thus, we can read Descartes' reference to self-subsistent things, in need of Divine concurrence, as saying that at each instant they possess those features that define *for us* what they are and do, so long as God continues to underwrite their existence from moment to moment.[10]

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[10] There is an interesting problem of how to conceive of self-subsistent things within a plenum, Slowik (2001) asks "in what sense is an individual corporeal part of the plenum really independent, and thus a substance?" (2001: 1). As with the discussion of motion, we want to suggest that by the time of *Principles*, independent substances must be understood along the lines of Descartes' epistemic stance.Slowik's primary purpose in raising the problem is to critique the "monist" conception of the material world sometimes read into Descartes

Since motion, for Descartes, is not a substance or a substantial form, it is not a thing (*res*) which can be brought into existence *per se*. Descartes no more wants substantial forms in the material world than he wants substantial forms of *species* or *eidola* in perception. If force or impulse were taken to be essential to an efficient cause what difference would this make to Descartes' view of motion? It would make force or impulse a property of matter, i.e., an efficient cause capable of creating motion. Minimally this entails that matter must be more than mere extension. It also entails that matter can create motion; that matter, like God or like the human will, can efficiently cause motion to be created where there was none before.Matter would be a self-mover, an even stronger position than what Descartes holds in *The World*, where he

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(see, for example, Keeling 1968, Gueroult 1980). The idea is that the plenum is "a non-individual corporeal substance" (ibid.: 4). Slowik's reconstruction of the argument for monism rests heavily on the "definition" of substance given in the *Principles*: "by 'substance' we *can understand* nothing other than a thing whose existence is such that it needs no other thing in order to exist" (I.51; italics added).

The "can understand" is crucial here, in part because of potential problems between this passage and the principle of the independence of the parts of time. Slowik, on behalf of the monists, targets a different potential inconsistency: "If [...] a substance can exist independently of any other thing, then the direct dependence of a Cartesian body on its contiguous neighbors (to delimit its surface) apparently undermines its claim to substancehood." (ibid.: 3).The issue, we argue, is in the switch from how we "can understand" a substance to the more ontologically charged implications of "exist independently". Slowik's primary tact is to investigate what constitutes a "real distinction" and he relies on *Principles* I, section 60: "A real [distinction] exists properly only between two or more substances: and we perceive these to be really distinct from each other from the single fact that we can clearly and distinctly understand one without the other." (ibid.). The epistemic talk in this passage demands that we tread carefully. Slowik does this only in part, drawing from the passage that, "if we can distinctly *understand* 'one [thing] without the other', then they really are distinct, *independently existing substances*." (ibid.: 11; italics added). While the "understand" is crucial, the corresponding "independently existing substances" is also couched in epistemic talk: "we perceive these to be really distinct". That is, the "substances" possess features that allow us to perceive them as distinct substances and to make sense of this in terms of our ability to understand one without the other.

conceives matter to be self-evolving. Descartes reaffirms that only God, or will, can be causes of motion when late in his life he writes: "The power causing motion may be the power of God himself conserving the same amount of translation as he put in it at the first moment of creation, or it may be the power of created substance like our soul, or of any other thing he gave the power to move a body." (Letter More, August 1649; K: 257; AT V: 402; see also, Descartes to More, 15 April 1649; AT V: 347). *Qua* extension matter has no powers, therefore it is basically unintelligible that matter could move itself. Perhaps one might think of Cartesian "inertia" as being self-motion. But this goes against what Descartes says in claiming that motion and rest are equivalent states. Being in a state just means that we have a law of harmony, i.e., conservation, which ranges over all moments in time, and gives sense to claims about things being in the same state over time. This is the identity we spoke of above.

This discussion about causal powers in horizontal causality has an analogical implication in the vertical scheme. Causation is possible only because both God and the human will are greater in perfection than matter, and so can efficiently create "motion" in matter (CSM II: 99; AT VII: 138). With respect to God's efficient causation this is done in accordance with Divine constancy which is why conservation holds. If the human will can create motion anew rather than simply change the states of motion, then Descartes has a problem with conservation. But the will acts in accord with mind/body harmony, which is the mind/body teleological system. And if this system works in accord with the material motion teleological system, then Descartes need not have a problem with equilibrium notions, since those needed for understanding are only local. This alternative maintains that the creation of new motion in accordance with conservation holds only in "actually" closed systems. If, however, motion in the material world were a possible cause of other motion in the material world, of the existence of new motion and not just a function of "formal" proportional rearrangement, Descartes would have a real problem in regard to his ontology of conservation. Conservation would have to hold over actions or forces or other substantial properties of this sort.

When Descartes, in *Meditation* VI, said that material things are the active principles that cause our perceptions of objects, he was referring to the fact that material things are in motion. At that time, he thought

motion was a real property of bodies, something akin to a virtual substantial form. Later, by the time of the *Principles*, motion understood as an active principle, or a substance like principle, becomes simply the way we humans describe motion, i.e., as an activity in the material world. We need to be able to talk about, e.g., inclinations to straight-line motions, though this does not describe a "real" activity nor a "real" cause. Causality for Descartes works via the causes that are constituted through teleological harmony.

Nor is Descartes an occasionalist since his harmony laws range over time and make humanly intelligible the relations among bits of matter from moment to moment. Of course, Descartes' voluntarism dictates that God need not do this. But since Descartes' God is no deceiver, he chooses freely to allow humans to have some "adequate" knowledge of the world. So on Descartes' picture, humans can do physics and learn about the material world, which is what he said at the end of his *Mediations*. The *Principles* show how humans may do this with regard to the material world. That is what books II, III, and IV are all about, getting scientific results. Descartes sums it up towards the end of his *Principles of Philosophy*:

> There are, even among natural things, some which we judge to be absolutely and more than morally certain; basing our judgment on the Metaphysical foundation that God is supremely good and by no means deceitful, and that accordingly, the faculty which he gave us to distinguish the true from the false cannot err when we use it correctly and perceive something clearly with its help. Such are Mathematical demonstrations; such is knowledge that material things exist; and such are all evident demonstrations which are made concerning material things. (*Principles* IV: 206; M: 287; AT VIII-1: 328)

5. Conclusion

We're now in a position to see the full import of Descartes' epistemic stance. He has a growing belief in the unknowable (i.e., that things have properties the human mind can't grasp) that is a characteristic view of his late writings. If a substance is knowable through its principal attribute, there may be more things true of the existing substance than what we

conceive through the attribute we know.[11] In short, there may be more in things and properties in the world, than humans have the capacity to know. This point is made clearly to Gibieuf, 19th January 1642:

> Although I conceive the soul and the body as two substances that I can conceive without each other, and which I can even deny of each other, I am not certain that they exist in the way I conceive them. I do not deny that there can be in the soul and in the body many properties of which I have no ideas. I only deny that there are any which are inconsistent with the ideas I do have, including the idea of their distinctness; for otherwise God would be a deceiver and we would have no rule to make us certain of the truth. (AT III: 472)

Clearly Descartes holds that the mind can't exhaust the real, that there may be features of the world forever beyond the reach of human cognition. In a letter to More of 5 February 1649 he states the same view:

> True, our mind is not the measure of reality or of truth, but certainly it should be the measure of what we assert or deny. For what is more absurd or rash than to want to pass judgments on matters which we admit our mind cannot grasp. (AT V: 274)

Once again thought is not autonomous, but has to submit to the reality of existing things which are beyond the cognitive reach of the human mind. Nevertheless, although there exist unknowable properties in existing material objects, the true, distinct and teleologically necessary ideas of things we possess are guaranteed by a non-deceiving God.

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[11] This was first pointed out to us by Edward Collins, and illustrated in his Harvard dissertation, a section of which was given to us but which is not available.

REFERENCES

In text abbreviations:

CSM = John Cottingham, Robert Stoothof and Dugald Murdoch (1985), *The Philosophical Writings of Descartes*, I-III volumes, Cambridge University Press. (note: Volume III has A. Kenny as an additional editor)

AT = Charles Adam and Paul Tannery (1964), *Oeuvres de Descartes.* Paris, J Vrin.

M = René Descartes (1983), *Principles of Philosophy*, translated by Valentine Rodger Miller and Reese P. Miller, D. Reidell.

G = Stephen Gaukroger (ed.) (1998), René Descartes, *The World and other Writings*, Cambridge University Press.

O = Paul J. Olscamp (ed.) (2001), René Descartes, *Discourse on Method, Optics, Geometry, and Meteorology*, Hackett.

K = Kenny, Anthony (translator and editor) (1981 [1970]), *Descartes, Philosophical Letters*, Clarendon Press.

Anderson, Wallace (1976), "Cartesian Motion", in: Machamer, Peter and Turnbull, Robert (eds). *Motion and Time, Space, and Matter* (pp. 200-223), Ohio State University Press.

Ariew, R., Cottingham, J., & Sorell, T. (1998), *Descartes' Meditations: Background Source Materials*. Cambridge: Cambridge University Press.

Des Chene, Dennis (2000), "On Laws and Ends: A Response to Hattab and Menn"*Perspectives on Science*, 8, pp. 144-163.

de Silhon, J. (1998 [1626]),"The Two Truths", in: Ariew, R., Cottingham, J., & Sorell T. (eds.), *Descartes' Meditations: Background Source Materials* (pp. 177-198). Cambridge: Cambridge University Press.

Garber, Daniel (1992). *Descartes' Metaphysical Physics*, University of Chicago Press.

Geroult, M (1980), "The Metaphysics and Physics of Force in Descartes", in: Gaukroger, S. (ed.), *Descartes: Philosophy, Mathematics and Physics*, Harvester.

Hattab, H. (1998), *The Origins of a Modern View of Causation: Descartes and his Predecessors on Efficient Causes.* Ph.D. Dissertation, University of Pennsylvania.

Keeling, S.V. (1968), *Descartes*, 2nd edition, Oxford University Press.

Morin, J. (1998 [1635]),"Quod Deus sit",in: Ariew, R., Cottingham, J., & Sorell, T. (eds.), *Descartes' Meditations: Background Source Materials* (pp. 231-251). Cambridge: Cambridge University Press.

Slowik, Edward (1999), Descartes Space-Time, and Relational Motion, *Philosophy of Science,* 66, pp. 117-39.

Slowik, Edward (2001), Descartes and Individual Corporeal Substance, *British Journal for History of Philosophy*, 9, pp. 1-15.
Watson, Richard (2003), *Cogito, Ergo Sum*, David R. Godine Publisher.