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ARTICLE



Descartes and More on the infinity of the world

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ABSTRACT

In this paper, I address the controversy between Henry More and René Descartes on the indefinite extension of the world. I provide a new reading of Descartes' famous final answer of 15 April 1649. I read the entire debate in the terms of a disagreement concerning the epistemological status of the necessity of our judgement about the extension of the universe. Accordingly, the disagreement on the infinity of the world constitutes a case of a more general disagreement on the nature of the necessity of the theorems of Cartesian Physics. In particular, as concerns Descartes' last reply, I argue that his assertion that a finite world is contradictory should be interpreted as a reply to More's claim that the thesis of the infinity of the world, in so far as it cannot be grounded on the identity between matter and extension, does not express a logical necessity. Descartes' assertion of the logical impossibility of a finite world, far from being, as it has always been read, a concession he made under the pressure of More's objections, expresses the more radical element of the entire debate about the extension of the universe.

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Abbreviations: AT = *Œuvres de Descartes*, éd. par Ch. Adam et P. Tannery, nouv. présent. par J. Beaudet, P. Costabel, A. Gabbey et B. Rochot, 11 vols., Paris, Vrin, 1964–1974; CSM = *The Philosophical Writings of Descartes*, ed. and transl. by John Cottingham, Robert Stoothoff, Dugald Murdoch, vols. 1 and 2. Cambridge, University Press, 1985–1991; CSMK = *The Philosophical Writings of Descartes*, ed. and transl. by John Cottingham, Robert Stoothoff, Dugald Murdoch, and Anthony Kenny, vol. 3: *The Correspondence*; CB = J. Cottingham (ed.), *Descartes's Conversation with Burman*, Oxford, Clarendon Press, 1976; B = *René Descartes, Tutte le lettere 1619–1650* (2005), a cura di G. Belgioioso, con la collaborazione di I. Agostini, F. Marrone, F. A. Meschini, M. Savini e di J.-R. Armogathe, Bompiani, Milano, 2009; OO = *Henrici Mori Opera omnia, tum quæ latine, tum quæ anglice scripta sunt; nunc vero latinitate donata*, vol. 3, Londini, ex typ. J. Maycock, sumptibus J. Martyn et W. Kettilby, 1675–1679 (facsimile reprint: Hildesheim, G. Olms, 1966); CP = *The Complete Poems of Dr. Henry More (1614–1687)*, ed. by A. B. Grosart, St. George's, Blackburn, Lancashire, printed for private circulation, 1878 (facsimile reprint: Hildesheim, G. Olms, 1969); the second edition (1647) is available in a critical edition: *A Platonick Song of the Soul*, edited with an introductory study by A. Jacob, Lewisburg, Bucknell University Press, 1998. With the exception of More's letters to Descartes, that are still not translated into English, all the translations are taken from CSM (K), though I have altered them from time to time. The translation of More's letters to Descartes is mine.

The main objection that Henry More addressed to René Descartes in their correspondence concerns the definition of matter as extension given in the *Principia philosophiæ* II, article 4 (CSM I: 224, AT VIII-1 42). In his first letter of 11 December 1648, More claims that extension is too broad a *definiens* for the *definiendum* in so far as it applies not only to material substances, but to incorporeal ones too: God, indeed, is an extended substance, and the angels too. According to More, generally, everything that subsists by itself is an extended thing, and extension is enclosed by the same limits as the absolute essence of things, though this absolute essence can vary according to the variety of the single essences. In particular, God is extended in so far as he is omnipresent, and occupies intimately the whole world as well as its individual parts. Indeed, he could not communicate motion to matter (which he did once and, for Descartes,¹ he still does) if he does not touch matter or, at least, if he had not touched it at a certain moment. If God were not extended, he would not be present everywhere and occupy all spaces. Accordingly, God extends and expands in his own manner and, as a consequence, he is an extended thing (AT V: 238–9, B 672: 2596).

This objection, and the long discussion which follows, constitutes the main subject of the correspondence between More and Descartes, and it is presupposed in many questions throughout their exchange of letters. In criticizing Descartes' definition of matter, More claims he is certain that the main theorems of Cartesian Physics could stand even if such a definition is rejected, in so far as their truth is independent from the identification of matter with extension (AT V: 238, B 672: 2594). Descartes will express his disagreement on this point soon. In his first letter of 5 February 1649, he writes:

Moreover, I do not agree with what you very generously concede, namely that the rest of my opinons could stand even if what I have written about the extension of matter were refuted. For it is one of the most important, and I believe the most certain, foundations of my physics; and I confess that no reasons satisfy me even in physics unless they involve that necessity which you call logical or analytical, provided you except things which can be known by experience alone.

(Descartes to More, 5 February 1649: CSMK: 364, AT V: 275, B 677: 2622)

The development of the correspondence clearly shows that Descartes was right in his claim. As we will see, one of the main aspects of the disagreement between More and Descartes concerns the nature of the necessity that characterizes the main doctrines of the first two parts of the *Principia philosophiæ*. The discussion on Descartes' notion of an indefinite extension such as it was presented in articles 26–27 of the first part of *Principia philosophiæ* (CSM I: 201–2, AT VIII-1: 14–16) is an exemplary case of this disagreement. This controversy, that begins with the fourth objection of More's first letter, and is

¹More here alludes to Descartes' theory of the continuous creation: see *Principia philosophiæ*, I, art. 21, CSM I: 200, AT VIII-1: 13.

developed in the following letters, will be the object of my paper. I will investigate whether, and to what extent, More's objections lead Descartes to modify his initial account of an indefinite extension, as it was offered both in the *Principia philosophiæ* and in the first letter to More.

The controversy between More and Descartes on the infinity of the world is a very well-known topic, and it was at the centre of important contributions by scholars such as Jean Laporte and Alexandre Koyré.² However, in spite of the relevance of the subject, there has not been much discussion of either of these two readings, in particular, as concerns Descartes' final answer on the controversy, contained in his second letter to More, of 15 April 1649, and there still remains a considerable gap in scholarship.³ In what follows, I will formulate a new reading of Descartes' reply to More, interpreting it in the terms of a disagreement that, from his point of view, concerns not only the fact that the world is or is not really infinite, but also the epistemological status of the necessity of our judgement about the extension of the world. I will argue that, in this sense, the disagreement between More and Descartes on the infinity of the world constitutes a paradigmatic case of their disagreement on the nature of the necessity of the physical theorems of *Principia philosophiæ*.

In the first part of this paper, I will summarize the main steps of the discussion between More and Descartes on the infinity of the world, focusing on some relevant texts. In the second part, I will propose an interpretation of these texts.

My main point will be that Descartes' statement in his letter of 15 April 1649 that the idea of a finite world entails a logical impossibility, far from being, as it has always been read, a concession made under the pressure of More's objections, must be interpreted as the last and more radical element of divergence between the two philosophers.

The discussion

The objection to the notion of an indefinite extension of the world addressed by More to Descartes is formulated as follows:

Fourth, I do not understand your indefinite extension of the world. This indefinite extension, indeed, is either absolutely (*simpliciter*) infinite, or only with respect to us (*quoad nos*). If you understand extension to be absolutely infinite, why do you obscure your thoughts by too low and too humble words? If this extension is infinite only in respect to us, it will be, in reality, finite. Indeed, our mind is not the measure of things, nor is it the measure of truth.

(*More to Descartes*, 11 December 1649: B 672: 2599, AT V: 242)

²See Koyré, *From the Closed World*, 110–24; Laporte, *Le rationalisme de Descartes*, 260–7.

³Among the more recent contributions, see, however, Kendrick, 'Uniqueness in Descartes "Infinite" and "Indefinite"'; Benitez Grobet, 'Is Descartes a Materialist?'; Schwartz, 'La question de l'infinité du monde et ses réponses cartésiennes'. On the contrary, the question is not addressed by the two recent, excellent, monographs on More's metaphysics: Reid, *The Metaphysics of Henry More*; Leech, *The Hammer of the Cartesians*.

More thinks that Descartes' notion of an indefinite extension is not intelligible. The reason is that it is necessary that what Descartes calls 'indefinite' is either infinite in itself or infinite with respect to us. The world is infinite or finite, and *tertium non datur*. But More does not limit himself to stressing that the notion of an indefinite extension is not intelligible. He focuses on the alternative between infinite and finite extension, and he strongly inclines towards the thesis of an infinite world. According to More, indeed, the infinity of the world has to be admitted once we acknowledge, on the one hand, God's infinite extension and, on the other hand, the Cartesian thesis that matter tends to move in a straight line from the centre of the vortices.

This argument was not new: More had already formulated it in 1646 in his *Democritus platonissans*. However, it should be observed that neither in this poem, nor in his correspondence with Descartes, does More present the infinity of the world as an undeniable truth.⁴ In the letters to Descartes, he only insists on the fact that he *inclines* to think that the world is infinite. And in *Democritus platonissans*, though rejecting the thesis of a finite world (that he formerly defended in 1642 in his *Psychoathanasia*, challenging the hypothesis of a finite world as contradictory), More describes the infinity of the world as nothing more than a hypothesis worthy of discussion.⁵

Nevertheless, the correspondence develops a strategy that was merely sketched in *Democritus platonissans*, and that should be carefully considered here. More argues that, in spite of Descartes' prudence, the principles of Cartesian philosophy cannot hold without acknowledging that the world is really infinite. In other words, according to More, the infinity of the world should necessarily follow from the very premises of Cartesian philosophy. In this sense, in his correspondence with Descartes, what More advances on this point is less a criticism of Descartes' notion of an indefinite extension than an infinitist interpretation of Descartes' cosmology. In other words, the strategy at work here does not consist in directly opposing Descartes by claiming that the world is infinite, but rather in undertaking a work of persuasion in order to show that such a statement is entailed by Descartes' own assumptions.

The first argument alleged by More is an indirect proof. If the world is finite in extension, it will inexorably disintegrate. Indeed, given that, according to Descartes' own principles, matter tends to recede in a straight line from the centre of the vortices, a finite world will be dispersed in a vacuum filled up only by divine extension (*More to Descartes*, 11 December 1649: AT V: 242, B 672: 2588). It is clear, however, that this argument works only once we admit not only Descartes' own theory of the rectilinear movement of matter, but also a thesis which Descartes cannot accept, that is the existence

⁴As some scholars wrongly supposed: see, e.g. Koyré, *From the Closed World*, 114.

⁵*Democritus platonissans, To the Reader*, CP 90. See, on this, Gabbey, 'Philosophia Cartesiana Triumphata', 184.

of a space extended beyond the extension. This is the reason why scholars have sometimes challenged More on this point (Koyré, *From the Closed World*, 117–8).

Nevertheless, one should read this argument in the light of the strategy followed by More in the first point of this same letter where, as we have seen, in discussing the question of God's omnipresence, he adopted a quite similar line in order to demonstrate God's extension. God could not communicate any motion to matter, which he did once, and according to Descartes, he still does, if he did not touch the matter of the world:

Because how could he communicate motion to matter, which he did once, *and which, according to you, he does even now*, if he did not touch the matter of the universe [...]?⁶

(*More to Descartes*, 11 December 1649: AT V: 238, B 672: 2596, emphasis mine)

Of course, here Descartes completely disagrees with More, as I will argue in more detail below. But now I want to insist on More's strategy. According to him, once the argument of the infinity of the world is read in the light of the argument for God's extension, it becomes clear that the thesis of God's infinite extension should also be considered as a 'Cartesian' thesis, at least in the sense that it follows from Descartes' very own principles of philosophy.

But there is much more than this. From More's point of view, the thesis of an infinite extension of the world is not just a corollary necessarily entailed by the very premises of Cartesian philosophy. It also works as an alternative explanatory principle of one of the main theories of the second part of the *Principia philosophiæ*, in so far as it makes it possible to explain Descartes' theory of condensation and rarefaction at least as efficaciously as the identity between matter and extension:

Add that this hypothesis, that the world is finite *simpliciter* and in reality, has the same force to explain and confirm the explanation of the rarefaction and condensation that you proposed in articles 6 and 7, as the principle that *extension belongs only to body and the nothing cannot be extended*.

(*More to Descartes*, 11 December 1648: AT V: 242–3, B 672: 2600, emphasis in original)

More points out that the theorem of condensation and rarefaction would not follow as a *logical* consequence from the thesis of the infinity of the world, but only as a *physical* consequence: *Quod enim ibi præstat Logica seu contradictoria necessitas, idem hic necessitas Physica vel mechanica certissime præstabit* (AT V: 242–3, B 672: 2600). Nevertheless, this consequence would follow as necessary and absolutely certain: if everything is filled *in infinitum* by matter, or body,

⁶For Descartes' theory of the conservation of the world, see *Principia philosophiæ*, I, art. 21 (CSM I: 200, AT VIII-1: 13). See also *Meditationes*, III (CSM II: 33, AT VII: 48–9); *Responsiones V* (CSM II: 254–5, AT VII: 369–70).

and the matter cannot be penetrated by other matter, its expansion will not consist in the growth of the distance between the parts of the body that is extended, and its contraction will not consist in the fact that these parts get closer without expelling the particles interposed among them (AT V: 242–3, B 672: 2600).

There is a point that I would like to stress here, before focusing on Descartes' answer. The discussion of the infinity of the world, as More develops it, is strictly related to his criticism of Descartes' identification of matter with extension. The claim that More makes in his first letter, according to which the main theorems of Cartesian Physics would hold independently from the identity between matter and extension, is here developed: the thesis of the infinity of the world would offer an alternative foundation of the theorem of condensation and rarefaction. Now, as according to More, the infinity of the world follows necessarily from the basic principles of Descartes' philosophy, it becomes clear that, from More's point of view, this alternative foundation of the theory of condensation and rarefaction is also definitively grounded on the principles of Cartesian philosophy.⁷

If I dwell on this aspect, it is also because this perspective offers a more complete explanation of Descartes' reaction against More's arguments. Indeed, what these arguments undermine is not only the thesis of the identity between matter and extension, but its foundational and explanatory function in respect of the fundamental theorems of Cartesian Physics. What is at stake here is the entire *ordre des raisons* of the second part of the *Principia philosophiæ*. And the controversy on the infinity of the world should also be read in the light of this fundamental disagreement.

The first point Descartes addresses in his answer of 5 February 1649 on the question of the infinity of the world concerns More's accusation that the notion of an indefinite extension is proposed by Descartes for merely strategic reasons. Descartes replies that it is not an affectation of modesty (*affectata modestia*), but a necessary precaution (*cautela necessaria*) that explains his choice (CSMK: 364, AT V: 274, B 677: 2620). But why speak of an indefinite extension rather than an infinite one? Descartes does not evade the problem, and the answer which he alleges here is that God is the only being we positively know to be infinite:

God is the only thing I positively understand to be infinite. As to other things like the extension of the world and the number of parts into which matter is divisible, I confess I do not know whether they are absolutely infinite; I merely know that I know no end to them, and so, looking at them from my own point of view, I call them indefinite.

(Descartes to More, 5 February 1649: CSMK: 364, AT V: 274, B 677: 2620)

⁷On More's distinction, against Descartes, of logical necessity from physical necessity, see also Mamiani, *Teorie dello spazio da Descartes a Newton*.

What Descartes claims here is that in the case of God we do know that he has no limits. As regards the extension of the world, we do not know if it really has no limits; all we can say about it is that we do not perceive any limitation in it. We positively know that God is infinite, but we do not know positively if the world is infinite too. As a consequence, we can describe God as 'infinite' simpliciter, which is not the case with the extension of the world, which we can only call 'indefinite'.⁸

Notice that this is a strictly epistemological reason that explains the difference between infinite and indefinite. In commenting on this passage of the correspondence, Laporte rightly challenged the old historiographical thesis (that in fact can be traced back to More himself) that there were opportunistic reasons at the origin of Descartes' refusal to attribute infinity to the world. On the contrary, he claimed, the essential point concerned Descartes' theory of knowledge (Laporte, *Le rationalisme de Descartes*, 263). To formulate the terms of the question in accordance with the terminology that Descartes adopted in the *Meditationes*, the problem is the move from the level of the *ordo perceptionis* to the level of the *veritas rei*.⁹

However, what is at stake is to understand what are, exactly, the epistemological reasons which prevent such a move in the case of an indefinite world: for what reason may we not argue, from the fact that we perceive no limit in our representation of the world, that the world has no limits and, therefore, is infinite? Indeed, our perception contains no limitation both in the case of the infinite and the indefinite. Nevertheless, if we shift from the level of the perception to the level of the reality, we are certain that only the infinite contains no limitation, while we are not certain that the indefinite contains no limitation. But what is it that allows the move from the level of perception to the level of the reality in the case of the infinite and that does not allow the same move in the case of the indefinite?

The difficulty is even increased because of the fact that, in the whole correspondence with More, Descartes never explains the reason that should prohibit this move. Now, according to Laporte, the prohibition would relate to the move from the level of clearness and distinction to the level of truth. Laporte's point was that, in the case of an indefinite world, we cannot perceive clearly and distinctly that the world has no limits; and this prevents the conclusion that the world itself has no limits and is, therefore, infinite.

In what follows, I will argue that this interpretation cannot be accepted. Before coming to this, however, I want to insist on another aspect of the

⁸Descartes, here, refuses to claim that the world is infinite not because it is limitless only in some respects, but because the particular respect (that is, its extension) in which it has no bounds allows one to say only that it is indefinite. In his letter to Chanut of 7 June 1647 (CSMK: 320, AT V: 52) and in the conversation with Burman (CB: 34, AT V: 103), he adds that such limits could be known by God: though we cannot conceive that the world is limitless, still it is possible that God could conceive it as limited. See also Kendrick, 'Uniqueness in Descartes "Infinite" and "Indefinite"', 30.

⁹See *Meditationes, Praefatio* (CSM II: 7, AT VII: 8); *Responsiones IV* (CSM II: 159, AT VII: 226).

story. More and Descartes agree on the principle that the move from the level of perception to the level of reality is problematic. The disagreement between them is not about the principle itself, but about its application. More argues that Descartes should acknowledge that the world is infinite precisely on the basis of the argument that the distinction between the infinite and the indefinite only holds at the level of human representation and that it does not express a rule of reality itself. Descartes answers that it is More who does not respect this principle: according to Descartes, in so far as More claims that the world should be affirmed as infinite, he is committed to an illicit inference from our perception to reality.

Descartes' argument is that even if our mind is not the measure of reality and truth, nevertheless it is the measure of what we affirm and deny; consequently, we must suspend our judgement on the infinity of the world. Indeed, to affirm or to deny that the world is infinite would mean affirming or denying what we acknowledge to be behind our capacities of perception. And, according to Descartes, it turns out that this is exactly what More does when he argues that, if extension is infinite only in respect to us, it will be finite in reality:

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. What is more rash or absurd than to want to make judgments about matters which we admit our mind cannot perceive. I am surprised that you seem to wish to do this when you say 'is infinite only in respect to us, it will be, in reality, finite'.

(Descartes to More, 5 February 1649: CSMK: 364, AT V: 274, B 677: 2620)

It is from this perspective that Descartes' reply to the arguments used by More in order to prove the infinity of the world should be read. From Descartes' point of view, to prove that More's arguments do not work means proving that our perception of an unlimited world is not a sufficient ground for establishing that the world is infinite in itself. Descartes thus argues that it is not true, as More claims, that if the extension of the world is finite, the vortices will be dispersed into the infinity of God's extension and the world will be destroyed. Indeed, More's argument rests on the false premise that God is extended, but given the identity between matter and extension, to conceive of God as extended means to make God a divisible thing and to attribute to him all the essence of a corporeal thing (CSMK: 364, AT V: 274, B 677: 2620).

The question about the infinity of the world is here connected with the discussion of the definition of matter by extension and God's omnipresence that was at the core of More's first difficulty. In replying to More on this, Descartes had claimed that the only sense in which we can affirm that God is extended is that he is everywhere (*ubique*), because he is *not* endowed by a true extension; in this sense, God can be called extended by analogy (*per analogiam*) only (CSMK: 361–362, AT V: 270, B 677: 2616).

However, Descartes also has another argument. He argues that, in order to preclude the idea of a place where the particles of the vortices could escape, it will be sufficient to establish that the extension of matter is indefinite, because wherever such a place might be conceived, it would contain some matter. Indeed, to claim that the matter of the world is indefinite means precisely that it extends farther than all that can be conceived by us (CSMK: 364, AT V: 275, B 677: 2620). Notice that in contrast with his first argument, Descartes' second argument does not rely at all on the idea of an unextended God. This is very helpful in understanding the strategy used here by Descartes. His aim is to answer to the objection concerning the dispersion of the vortices without recurring to a premise on which the disagreement with More would be complete.

In order to challenge More's argument, Descartes claims that it is sufficient that the world is indefinite in the sense just described above: we do not know if the world is really infinite in itself, but we know that if there is a place located behind whatever I can perceive, there will be some matter in that place; and this is a sufficient premise to guarantee that there will not be any empty space where the vortices will be dispersed. Of course, in claiming that the world is indefinite, we acknowledge that it extends further than anything a human being can conceive. Nevertheless, it is still true that the indefinite extension of the world has nothing to do with God's infinity:

Nevertheless, I think there is a very great difference between the amplitude of this bodily extension and the amplitude of divine substance or essence (I do not say 'divine extension' because, strictly speaking, there is none); and so I call the latter absolutely 'infinite', and the former 'indefinite'.

(*Descartes to More*, 5 February 1649: CSMK: 364, AT V: 275, B 677: 2620–2)

According to this argument, the world is indefinite (and not infinite) because its amplitude (even if it were really infinite) belongs to extension and not to substance or essence; and this is the reason why it is only the divine substance and essence which can be affirmed as absolutely infinite. I would like to insist on this point: in claiming that the amplitude of the extension of the world has to be distinguished from God's extension, Descartes is not committed to affirming a real infinity (in extension) of the world. What he states is rather that even if the world were infinite, its infinity would be different in respect of God's infinity in so far as it would concern the quantitative level of extension.

It now becomes clear that in his correspondence with More, Descartes endorses two different strategies in order to justify the attribution of the term 'indefinite' (instead of the term 'infinite') to the world: firstly, in the case of the indefinite, the absence of any limitation concerns only our perception, and does not extend to things in themselves; secondly, if the world were really infinite, this infinity would concern only the quantitative level of the extension, and not the qualitative level of substance and essence.

In this sense, Descartes' account of the concept of the 'indefinite' in his first letter to More basically repeats the explanation offered in articles 26 and 27 of *Principia philosophiæ*, I (CSM I: 201–2, AT VIII-1 14–16). The only relevant difference lies in the use made of the concept of *amplitudo* in the letter to More: while the indefinite concerns the corporeal *amplitudo*, the infinite concerns the substantial *amplitudo*. If in the *Principia* Descartes had described the infinite in terms of absence of limits *ex omni parte* and the indefinite in terms of absence of limits *sub alia consideratione*, in the correspondence with More the infinite and the indefinite are both classified under the same category of *amplitudo*, and then they are distinguished by an internal subdivision of the concept of *amplitudo* (on the one hand, *amplitudo extensionis* and, on the other hand, *amplitudo substantiæ*). For the rest, Descartes' account in his first letter to More does not differ from the one he had given in articles 26 and 27 of *Principia*, I, which prompted More's original objection.

This explains why, in his second letter of 5 March 1649, More declares his dissatisfaction with Descartes' answer. More's argument consists essentially of two steps. Firstly, he states that, even if we admit that we are not able to know if the world is infinite or finite, it is nevertheless certain that the world, in itself, cannot but be infinite or finite. Indeed, as regards things like the extension of the world, or the parts in which matter is divisible:

[...] you cannot ignore that they are either absolutely infinite or really finite, though you cannot as easily establish whether it is the one or the other.

(*More to Descartes*, 5 March 1649: AT V: 304, B 684: 2646)

Though stressing the difficulty of an inference from the level of perception to the level of things considered in themselves (*simpliciter*, or *reipsa*), More considers the following judgement as certain: the world is in itself finite or infinite. Accordingly, though it is difficult to establish which of the two terms of the alternative is true, nevertheless it is necessary that one of them is true. Within these limits, it is possible to grasp things in themselves and to formulate a judgement of them:

My mind touches here the things I am speaking about.

(*More to Descartes*, 5 March 1649: AT V: 304–5, B 684: 2646)

However, More does not limit himself to stating, as certain, that the world is infinite or finite. As he did in his first letter, in his second letter too he formulates some arguments aiming to prove that the thesis of the infinity of the world is entailed by the very principles of Cartesian philosophy. The argument based on the movement of the vortices is still at work (AT V: 304, B 684: 2646), but is now integrated with another argument, grounded on God's omnipresence: given that God exists everywhere, he should have produced matter everywhere, because otherwise he would be idle (*otiosus*: AT V: 304, B 684: 2646).

One should observe that this argument rests, once again, on More's claim that Descartes agrees with him in recognizing God's omnipresence. This claim is now strengthened, according to More, by Descartes' first reply: the only kind of extension that Descartes denies to be in God is the one that is endowed with tangibility and impenetrability, and it is true that such an extension is not in God (AT V: 301, B 684: 2642). However, More now has another argument, which is grounded on a claim that Descartes actually made in his former letter. Descartes had written that to prevent a place from being conceived where the particles of the vortices could escape, it would be sufficient to acknowledge that wherever such a place was conceived, it would contain some matter. Now, according to More, in making this claim, Descartes definitively acknowledges the world as infinite. Indeed, according to Aristotle, the infinite is exactly 'that of which there is always something beyond':

Here you are a very prudent man, and elegantly modest. Nevertheless, you finally acknowledge that the world is infinite, if Aristotle correctly defines the infinite in the third book of *Physics*, οὐ ἀεί τι ἔξω ἐστίν, that of which there is always something beyond. And now there is nothing else on which we disagree.

(*More to Descartes*, 5 March 1649: AT V: 307, B 684: 2650)

More thinks that Descartes' account of an indefinite extension coincides in fact with Aristotle's definition of the infinite. As a consequence, he claims, there is no more disagreement between them: *Nihil nunc est ulterius, quod dissideamus*.

To sum up, in his first letter, More affirmed that if the world is not infinite, the vortices would be dispersed in the infinity of God's extension. Descartes objected that this is not true because, wherever a place might be conceived, it would contain some matter. Now, More replies that this is exactly the definition of infinity.

However, it should be observed that, in his second letter to Descartes, More clarified an essential point in his conception of the infinity of the world. When More affirms that the world is infinite, he is not speaking about the infinity of an empty space: what he has in mind is, rather, the infinity of matter that is extended as much as space is. This is the reason why, for More, Descartes' objection, according to which wherever a place is conceived, it will contain some matter, far from denying the infinity of the world, entails it.

The disagreement between More and Descartes is not about the existence of the void, which they both deny, but on the basis of this denial. If, according to Descartes, this denial is founded on the identity between matter and extension, for More, it is grounded on the principle that God is never *otiosus*.

This explains why More does not limit himself to stressing that Descartes, in spite of his use of the term 'indefinite', has actually acknowledged the world as infinite. He adds that Descartes' claim has not been grounded on a true way

to demonstrate such a truth. In so far as the identity between matter and extension is not established, indeed, it cannot justify the infinity of the world:

I am not at all sure, however, whether you actually found the true way to demonstrate (*veram demonstrandi rationem*) this truth. For the reasons I gave before, indeed, I must confess that I am not yet able to grasp the principle of that demonstration, 'whatever is extended is a real and corporeal being'.

(*More to Descartes*, 5 March 1649: AT V: 308, B 684: 2650)

According to More, the problem is not just that the thesis of the infinity of the world cannot be grounded on the identity of matter and extension, but that such an identity suppresses both the extension of God and empty space. Now, if both God's extension and space are eliminated, not only an infinite extension, but also an indefinite one will be unnecessary:

If neither empty space, nor God is extended at all, your philosophy would not need indefinite matter either: a determinate and finite number of stages would be enough. Indeed, the sides of this finite world will not be able to move back, and the vortices that are in the middle will not be able to open up so that an intermediate space will be extended and non being will acquire new dimensions.

(*More to Descartes*, 5 March 1649: AT V: 308, B 684: 2650)

Descartes' reply of 15 April 1649, though very short, marks a true turning point in the correspondence. Descartes expresses once again his disagreement with More on the question of God's omnipresence: God is everywhere by his power (*ratione suæ potentiæ*), but not by his essence (*ratione autem suæ essentiæ*), which has no relation to space (CSMK: 373, AT V: 343, B 694: 2682). Nevertheless, in answering the objection that, if God's extension (or an empty space) were suppressed, a finite world would be sufficient to prevent the universe from being destroyed, he writes:

It conflicts with my conception to attribute any limit to the world.

(*Descartes to More*, 15 April 1649: CSMK: 374, AT V: 344, B 694: 2684)

The words that Descartes employs here are *repugnare meo conceptu*, which designate a logical contradiction. However, in making this claim, he also points out:

The reason why I say that the world is indeterminate, or indefinite, is that I can discover no limits in it; but I would not dare to call it infinite, because I perceive that God is greater than the world, not in extension (for I have often said I do not think he is strictly speaking extended) but in perfection.

(*Descartes to More*, 15 April 1649: CSMK: 374, AT V: 344, B 694: 2684)

The reason why the world, unlike God, should not be called infinite is that God is much bigger than the world not because of his extension (*ratione extensionis*), in so far as he is not extended at all, but because of his perfection (*ratione perfectionis*). A fundamental difference remains therefore between God and

the world, but for the first time, at least in the correspondence, this difference is grounded on the assumption that both the idea of God and the idea of the world are the idea of something infinite.

But does this statement amount to affirming that the world itself, and not only what is represented by its idea, is actually infinite in its extension?

Reading Descartes' last reply from a new perspective

In order to address this problem, I would like to focus on Descartes' claim, in his second letter to More, that a finite world is contradictory, and to compare it with the position he expressed in his first letter. There is a terminological side of the question that needs to be analysed. In his first letter to More, Descartes basically follows the account given in the *Principia philosophiæ*. He describes our perception of the indefinite as the perception of something in which we do not acknowledge any limit: [...] *nullos limites agnoscimus* (CSM I: 202, AT VIII-1: 5); [...] *in illis nullum finem agnoscere* (CSMK: 364, AT V: 274, B 677: 2620).

The Latin text is ambiguous. *Agnoscere*, here, can have two different meanings, according to the sense we ascribe to the negation expressed by the words *nullum* and *nullos*: (a) in the first sense, it means that we know that there are no limits; and (b) in the second sense, it means that we do not know any limit. The difference here is between: (a) *to know* that there are *no* limits; and (b) *not to know* any limit. Or, in other words: (a) in the first sense, we exclude the existence of limits; and (b) in the second sense, we abstract from the existence of limits.

Now, according to Descartes, every inference which is grounded on abstraction is a negative argument. On the other hand, an inference that is grounded on an exclusion constitutes a positive argument. This is what Descartes claims in his letter to Mesland of 2 May 1644, in discussing the real distinction between soul and body (CSMK: 236, AT IV: 120, B 454: 1914). Is it possible to read Descartes' two different accounts of the indefinite in his correspondence with More in the light of the distinction between abstraction and exclusion? Or, more precisely, is it possible to interpret, on the one hand, concerning Descartes' first letter to More, the prohibition on moving from the level of the perception to the level of things in themselves as a form of negative argument (by *abstraction*) and, on the other hand, concerning Descartes' second letter, to read the claim that the representation of a finite world is contradictory as a premise for the positive argument (by *exclusion*) that the world is really infinite?

The discussion of the interpretations proposed by Laporte and Alquié will be helpful in addressing this question. According to Laporte, the perception of a finite world constitutes the case of a contradiction not clearly and distinctly perceived; now, it is only in the presence of a clear and distinct perception that the inference from the level of perception to the level of things

in themselves is allowed. Therefore, the world cannot be called infinite, but only indefinite (Laporte, *Le rationalisme de Descartes*, 262–3). Koyré proposed a different interpretation in the context of a diachronic reading of the correspondence. According to him, the difficulties posed by More motivate a change in Descartes' account of the indefinite. If in his first letter, Descartes limited himself to claiming that we do not perceive any limit in the world, in his second letter he claims that the world has no limits, since it is contradictory to affirm that the world would be limited. Koyré thinks that Descartes denies the possibility of an inference from perception to things in themselves only in his first letter, in which he does not affirm that the idea of a finite world is contradictory. On the contrary, in his second letter, once the concept of a finite world is acknowledged to be contradictory, Descartes actually acknowledges the world is infinite (Koyré, *From the Closed World*, 124).

As often happens, opposite readings share a common assumption. Indeed, both in Koyré's and Laporte's interpretations, what prevents the inference from the level of perception to the level of reality is the lack of a contradiction in the perception of a finite world. Now, in my opinion, this is wrong.

However, before coming to this last point, let us examine what I consider the two main difficulties in Koyré's and Laporte's accounts. As concerns Laporte's, the problem is that the distinction between two different kinds of contradictions – the first one obscurely perceived, and the second one clearly perceived – has no textual support, at least in the case of the infinite. On the other hand, Koyré's reading cannot explain the fact that Descartes had affirmed that a finite world is contradictory even before his correspondence with More. This is clear from his letter to Arnauld of 29 June 1648:

But I do not think that we should ever say of anything that it cannot be brought about by God. For since every reason for anything's being true and good depends on his omnipotence, I would not dare to say that God cannot make a mountain without a valley, or bring it about that 1 and 2 are not 3. I merely say that he has given me such a mind that I cannot conceive a mountain without a valley, or a sum of 1 and 2 which is not 3; such things involve a contradiction in my concept. I think the same should be said of a space which is wholly empty, or of an extended piece of nothing, or of a limited universe; because no limit to the world can be imagined without its being understood that there is extension beyond it; and no barrel can be conceived to be so empty as to have inside no extension, and therefore no body; for wherever extension is, there, of necessity, is body also.

(*Descartes for Arnauld*, 29 July 1648: CSMK: 358–9, AT V: 223–4, B 665: 258)

The thesis of the logical impossibility of a finite world is here advanced independently of any solicitation by Arnauld: it is spontaneously introduced as a mere example in the context of a discussion concerning the logical impossibility of the void. Therefore, it becomes extremely complicated to read

Descartes' second letter claim that a finite world is contradictory as a concession to More determined under the pressure of his correspondent.

Accordingly, we must conclude that in his second letter to More: (1) Descartes actually claims that the idea of a finite world constitutes a case of a true contradiction (clearly and distinctly perceived, in contrast with Laporte's reading); and (2) nevertheless, in spite of this claim, he does not state that the world is really infinite (in contrast with Koyré's reading). In other words, even in his second letter to More, Descartes continues to deny the possibility of a move from the representation of an indefinite world to the positive assertion that the world is actually infinite.

To sum up, in spite of the clearness and distinctness of the perception of the logical impossibility of a finite world, we cannot pass from this perception to form an argument *par exclusion* which would allow us to state that the world is actually infinite.

However, two things still remain to be explained. Firstly, one could ask why Descartes advances the thesis that a finite world is contradictory only at this stage of the correspondence (i.e. in his second letter to More); or, in other words, one could ask what this claim adds exactly to the statement of the *non agnoscere*, that does not constitute, as we have seen, a good premise for an argument *par exclusion*. My point is that Descartes' assertion that a finite world is contradictory should be read as a reply to More's claim that the thesis of infinity of the world does not express a logical necessity, in so far as it cannot be grounded on the identity between matter and extension. In this light, no matter how strange it sounds, the thesis of the logical impossibility of a finite world, far from being, as it has always been read, a concession made by Descartes under the pressure of More's objections, should be interpreted as the last and most radical element of divergence between him and More. Once it is established that it is impossible to state that the world is actually infinite, Descartes insists on the fact that, in spite of this, the perception of a finite world is nevertheless contradictory, in so far as it contradicts the identity between matter and extension.

A decisive proof in support of my reading is given in a passage of the same letter of 15 April 1649. This is a reply to the following question by More: did God establish (or could He have established) that the world is finite? Indeed, a strong argument against the thesis of the infinity of the world is that many people think it is possible that it is finite (AT V: 312, B 684: 2653). In answering to More, Descartes writes:

It conflicts with my conception, or, what is the same, I think it involves a contradiction, that the world should be finite or bounded; because I cannot but conceive a space beyond whatever bounds you assign to the universe; and on my view such a space is a genuine body.

(Descartes to More, 15 April 1649: CSMK: 374, AT V: 345, B 694: 2684)

Notice that here it is explicitly stated that the reason why a finite world should be considered as contradictory is the identity between matter and extension.¹⁰ In this light, now, we can also understand in which sense, according to Descartes, the perception of a finite world is contradictory: such a perception contradicts a necessarily true proposition, i.e. the identity between matter and extension.

However, this also means that Descartes' statement that a finite world is contradictory does not entail any ontological commitment to the affirmation that the world is in itself infinite. It only expresses, at a merely epistemological level, the logical necessity of our perception of an infinite world, in so far as it follows as a necessary consequence from the identity between matter and extension. But it does not entail the actual truth of this necessity. The inference from the level of the perception to the level of the reality is still unachieved.

A second question is still open, however, namely, why such an inference should not be allowed even in the case of a perception of a logical impossibility: why does Descartes continue, in his second letter, to deny the possibility of moving from a clear and distinct perception of an infinite world to the ontological claim that the world is actually infinite?

The reason has to be traced to his doctrine of God's omnipotence such as it is formulated in the correspondence with More. Descartes introduced this doctrine in points 2 and 3 of his first letter in order to reply to More's objection that the thesis of the logical impossibility of an empty space and atoms would limit God's omnipotence. Descartes' answer is that I am allowed to formulate judgements that concern only what I perceive, and not what is beyond my perception:

But you are quite ready to admit that in the natural course of events there is no vacuum: you are concerned about God's power, which you think can take away the contents of a container while preventing its sides from meeting. For my part, I know that my intellect is finite and God's power is infinite, and so I set no limits to it; I consider only what I am capable of perceiving, and what not, and I take great pains that my judgement should accord with my perception. And so I boldly assert that God can do everything which I perceive to be possible, but I am not so bold as to assert the converse, namely that he cannot do what conflicts with my conception of things – I merely say that this involves a contradiction [...].

(Descartes to More, 5 February 1649: CSMK: 363, AT V: 272, B 677: 2618)

¹⁰More will identify the presuppositions and the dangers of Descartes' claim: the admission of both the identity between matter and extension and the infinity of the world would unavoidably lead to the elimination of God from the world. See, in particular, *Scholium ad Epistola 2* (OO II.2: 254) and *Enchiridium Metaphysicum, Ad Lectorem Præfatio*, section 4 (OO II.1: 136). In the *Enchiridium metaphysicum*, the first demonstration of the existence of the immaterial substances starts from the distinction between extension and matter (OO II.1: 158–61). Here, moreover, More will reject the thesis of the infinity of the world. See the five arguments alleged in chapter 10, sections 6–14 (OO II.1: 179–82).

In the same way I say that it involves a contradiction that there should be any atoms which are conceived as extended and at the same time indivisible.

(*Descartes to More*, 5 February 1649: CSMK: 363, AT V: 273, B 677: 2620)

The discussion about the infinity of the world should not be separated from the discussion about God's omnipotence which immediately precedes it in the correspondence, and whose solution is grounded on the exact same principles.

Now, in the only other text (i.e. the letter to Arnauld of 29 July 1648) where Descartes clearly states that a finite world is contradictory, this case is assimilated to the logical impossibility of the void. The fact that I perceive as contradictory the void, or a nothing that is extended, or a finite world, does not entail – he claims – that God cannot produce these things, but only that they cannot be conceived:

I think the same should be said of a space which is wholly empty, or of an extended piece of nothing, or of a limited universe; because no limit to the world can be imagined without its being understood that there is extension beyond it; and no barrel can be conceived to be so empty as to have inside it no extension, and therefore no body; for wherever extension is, there, of necessity, is body also.

(*Descartes to Arnauld*, 29 July 1648: CSMK: 359, AT V: 224, B 665: 2580)

Accordingly, in his first letter to More the reason for Descartes' prohibition of a move from the level of the perception of an infinite world to the judgement that the world is actually infinite is not, as Laporte thinks, that our perception does not grasp clearly and distinctly that a finite world is contradictory; nor, as Koyré thinks, that Descartes will acknowledge this perception as contradictory only in his second letter to More. The reason has to be identified with God's omnipotence: divine power is beyond everything we can perceive and, as a consequence, it always prevents us from moving from perception, though clear and distinct, to truth.

What Koyré and Laporte's interpretations have in common is, once again, the idea that the denial of the inference from the level of the perception to the level of the reality only concerns perception 'not clear and distinct. And this is wrong: though it is true that Descartes' insistence on the necessity of adopting the term 'indefinite' is grounded on epistemological reasons, the barring of a move from the level of the perception to the level of the reality is not the barring of a move from pseudoevidence to truth, but from evidence to truth.

Of course, this interdiction does not concern the make-up of our souls, in so far as they are endowed with a certain mental structure. If this were the case, the entire project of the *Meditationes* and the theory of God's veracity would be destroyed. The possibility that Descartes considers in his correspondence does not concern the impossible eventuality that God might change the

principles of my knowledge once they have been established by him, but the original creation of these same principles.

The proof that the level considered by Descartes concerns precisely God's absolute power is that Descartes introduces the thesis of the logical impossibility of a finite world in response to More's objection concerning what God *could* have done:

First, I therefore ask if God *established* this or if he *could have done* it in a different way [...].

(*More to Descartes*, 5 March 1649: AT V: 312, B 684: 2654, emphasis mine)

Therefore, in answering More on this point, Descartes simply extends to the case of infinity the same reply that he had adopted in discussing the difficulties concerning the void and atoms: we are not authorized to set any limitation on God's power; nevertheless, we perceive the ideas of empty space, atoms and a finite world as contradictory.¹¹

Further confirmation that this reading is correct is the fact that the case of the infinity of the world had been assimilated by Descartes himself to the case of the void in the same letter to Arnauld that I quoted previously: *Idem* [...] *dicendum puto*.

Whether such an interpretation can hold in relation to the *Principia philosophiæ* as well is a question I will not deal with here. My proposed interpretation seems to me to be authorized only with respect to Descartes' correspondence with More, but it allows us to explain the strange fact that I stressed above: the absence of any explication, by Descartes, of the reason that prohibits the inference from the domain of representation to the domain of reality. Descartes did not need to return to a point that he had established at length in answering the objections to the void and atoms.

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¹¹Actually, the interpretation of these texts is controversial. However, most of the interpreters, with the only relevant exceptions being Frankfurt ('Descartes on the Creation of the Eternal Truths') and Beysade (*La philosophie première de Descartes*), agree that in stating that we are not allowed to claim that God cannot do what conflicts with our conception of things, Descartes is only referring to what God could have done, and not to what God can currently do: this is also the position of Marion (*Sur la théologie blanche de Descartes*).

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