

Cartesian Bodies

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I Introduction

How we understand Descartes's physics rests on how we interpret his ontological commitment to individual bodies, and in particular on how we account for their individuation. However, Descartes's contemporaries (notably, Cordemoy and Leibniz) as well as contemporary philosophers (notably, Kenny and Garber) have seen Descartes's account of the individuation of bodies as deeply flawed. In the first part of this paper, I discuss how the various problems and puzzles involved in Descartes's account of the individuation of bodies arise, and the relevance of these problems for his physics. With an eye toward resolving these puzzles, I argue for an interpretation of the Cartesian ontology in which bodies are not individuated by motion but, instead, are mind-dependent. As part of this reading, I demonstrate the sense in which we can clearly and distinctly perceive bodies, and also the senses in which the real, conceptual, and modal distinctions apply to them. I conclude by explaining how this account of the mind-dependent individuation of bodies is consistent with Descartes's definition of 'motion' and 'a body' in *Principles*, Part II, section 25 — the very passage that prima facie entails the most troubling of the individuation puzzles. Finally, I show that this account is consistent with Descartes's general goal in constructing his physics.

II Motion and the Individuation of Bodies

One way that individuation issues arise is from Descartes's definition of 'motion' in *Principles of Philosophy*, Part II, section 25:

[Motion] is the transfer of one piece of matter, or one body, from the vicinity of the other bodies which are in immediate contact with it, and which are regarded as being at rest, to the vicinity of other bodies. (AT VIII A 53; CSM I 233)¹

Here Descartes defines 'a body' as that which is in local motion; this seems to imply that local motion individuates bodies.² However, if bodies are individuated by local motion, then a body ceases to be a body when it is not in local motion. Thus, the possibility of resting bodies is precluded because a motion cannot individuate such bodies. As Garber notes, this problem led Cordemoy to retreat to atomism, and thus to discount the central Cartesian tenet that bodies are by nature divisible.³

Leibniz, too, thought puzzles about individuation result from Descartes's account of motion. In *De Ipsa Natura*, Leibniz — arguing explicitly against J.C. Sturm, but commonly taken as addressing Cartesian views of matter and motion in general⁴ — constructs a puzzle that purportedly shows that even bodies in motion are not individuated.⁵ He

1 I thank Alan Nelson, Paul Hoffman, and Patricia Easton for working with me as I developed the views presented here, and also Nick Jolley and Larry Nolan, who commented on earlier drafts of this paper. I have benefited from audiences present at professional meetings where I presented earlier versions of this paper, and also from the comments of those who responded to these papers: Alison Simmons, at the 1998 Pacific American Philosophical Association, and Jeremy Hyman, at the 1997 Descartes, Cartesianism, and Anti-Cartesianism Conference at University of California, Irvine. I am also grateful for the discussions at meetings of the Southern California Cartesian Circle, and to the referees for the *Canadian Journal of Philosophy* for their very helpful comments.

The abbreviations to editions of Descartes's works are as follows:

AT: *Oeuvres de Descartes*, Vols. I-XII and Supplement, ed. Charles Adam and Paul Tannery (Paris: Leopold Cerf, 1897-1913).

CSM: *The Philosophical Writings of Descartes*, Vols. I and II, trans. John Cottingham, Robert Stoothoff, and Dugald Murdoch (Cambridge: Cambridge University Press 1985).

CSMK: *The Philosophical Writings of Descartes*, Vol. III, trans. John Cottingham, Robert Stoothoff, Dugald Murdoch, and Anthony Kenny (Cambridge: Cambridge University Press 1991).

2 As one of the anonymous reviewers points out, perhaps here Descartes is giving criteria for identifying a body, and not for defining 'a body.' There is, however, a long tradition of taking this passage as a definition; see Daniel Garber, *Descartes' Metaphysical Physics* (Chicago: University of Chicago Press 1992), 157-72.

3 Garber, *Descartes' Metaphysical Physics*, 168-9.

4 Garber, *Descartes' Metaphysical Physics*, 179-81.

5 Gottfried Leibniz, *Philosophical Essays*, Roger Ariew and Daniel Garber, ed. and trans. (Indianapolis: Hackett 1989), 163.

argues that if local motion individuates bodies, then at any instant there cannot be a distinction between one body and another. But without intrinsic differences among bodies at an instant, there cannot be any intrinsic differences among bodies over time. If there cannot be intrinsic differences among bodies over time, then local motion cannot create intrinsic differences. Given that there are no intrinsic differences among bodies, nothing grounds extrinsic differences among them. For example, nothing grounds the changing position between one portion of extension with respect to another portion of extension. Therefore, the local motion of a body — which is an extrinsic feature of the body — cannot create intrinsic differences in bodies, and so motion cannot individuate bodies. This problem — and others like it — led Leibniz to construct a metaphysics in which the individuation of bodies is ‘grounded’ in a very specific kind of metaphysical atom — the monad.

Anthony Kenny discusses another way in which individuation issues arise. From Descartes’s definition of ‘motion,’ Kenny develops a puzzle reminiscent of those concocted by Zeno. The gist of the puzzle is this: though Descartes claims that the world is made up of bodies with different sizes, there is no way these bodies can be individuated. Individuation can come about only by means of a body’s ‘geometrical properties’ or its ‘non-geometrical properties’ (Kenny’s terminology), but bodies cannot be distinguished by their geometrical properties because, for Descartes, extension is homogeneous. Nor can they be distinguished by their non-geometrical properties, because local motion is the only non-geometrical property bodies have, and local motion is not possible given Descartes’s physical principles.⁶ In support of the claim that local motion is not possible given Descartes’s physical principles, Kenny presents the following paradox:

Since all motion is in a circle and all the bodies making up the circle move together, they must make one body; thus, the only moving bodies will be complete rotating circles or rings. But motion is the translation of a body from the vicinity of one stationary body to another. But the whole ring, if the bodies within and without it are at rest, does not move. It could move by rotation if it were possible for one part of the ring to be in contact now with one external body and now with another. But there cannot be distinct parts of the ring unless there are parts of the ring with individual motions of their own. But this is not possible since rings can only move as wholes. Therefore, if Descartes’ theory of motion is correct, no motion is possible.⁷

6 Anthony Kenny, *Descartes: A Study of His Philosophy* (New York: Random House 1968), 214.

7 Kenny, *Descartes*, 214-15.

Two arguments compose this paradox: (1) the pieces of extension that are moving bodies are actually parts of rings; (2) the local motion of rings is impossible because rings can neither move from place to place nor rotate. His conclusion is that local motion is not possible according to Descartes's characterization of it. So there are no individual bodies in local motion; the universe is one block, undifferentiated, and at rest.⁸

On Descartes's view, if individuation cannot take place by motion, and if there are no atoms — either physical or mental — that individuate bodies, then what feature of bodies does account for their individuality? One possibility is that God is the individuating agent who gives each body its own essence. If God were to make stones, birds, and sticks as individual substances, then we would have to interpret him as doing this by uniting matter with essences and thus creating hylomorphic unities. However, although Descartes may be committed to some sort of hylomorphism for the human mind-body union⁹ (thus retaining some scholastic tendencies), he is obviously not interested in giving an account of the physical world in terms of form-like entities.

A second way of accounting for the individuation of Cartesian bodies is to maintain that bodies get their individuality from their determinate quantities of matter.¹⁰ But Descartes's physics rules out this interpretation. For Descartes, the universe is a plenum, and so is without vacuum. According to Descartes's famous theory of vortices, bodies are continually moving circularly and therefore are continually dividing. How can there be motion in a universe that is maximally full of bodies? Each body pushes other bodies in front of it while being simultaneously pushed by other bodies behind it, thus forming a large ring of motion. Descartes

8 There is another collection of closely related puzzles that concern the circular definitions of 'motion' and 'a body,' tensions between Descartes's characterization of motion as relative and motion's status as a mode, and the relation between the local motion of bodies and the quantity of motion in the universe that God creates. Some of the classical treatments of these issues are by W. Von Leyden, *Seventeenth-Century Metaphysics* (London: Garden City Press 1968), 271; René Dugas, *Mechanics in the Seventeenth Century* (Neuchatel: Editions de Griffon 1958), 172-3; R.S. Westfall, *Force in Newton's Physics: The Science of Dynamics in the Seventeenth Century* (New York: Neale Watson Academic Publications 1971), 57-8, 151; Thomas L. Prendergast, 'Descartes and the Relativity of Motion,' *Modern Schoolman* 49 (1972), 67; Stephen Gaukroger, *Descartes: An Intellectual Biography* (Oxford: Clarendon Press 1995), 373; Margaret Wilson, *Descartes* (New York: Routledge 1978), 77; and Garber, *Descartes' Metaphysical Physics*, 168-9.

9 Paul Hoffman, 'The Unity of Descartes's Man,' *Philosophical Review* 95 (1986), 347-9, argues that this is the case.

10 Jeremy Hyman made this point in conversation.

states that this is easy to understand when bodies move in perfect circles; however, when circles are irregular, there are some places in which they have room to go through, and there are other places through which they must squeeze. When a piece of matter has to squeeze through a small space, it has to change its shape (AT VIII A 58; CSM I 238). In *Principles*, Part II, section 34, Descartes calls these changes in shape ‘true cases of division’:

For what happens is an infinite, or indefinite, division of the various particles of matter; and the resulting subdivisions are so numerous that however small we make a particle in our thought, we always understand that it is in fact divided into other still smaller particles.... This minute shifting of position is a true case of division. (AT VIII A 59-60; CSM I 239)

Because of this continual division, individual bodies are not composed of a determinate quantity of matter. Consider the example of an individual stone. At the corpuscular level, the stone’s corpuscles are continually moving circularly and therefore continually dividing. Because of this continual division, it does not make good Cartesian sense to talk precisely about the number of corpuscles, or the ‘quantity of matter,’ that makes up a stone or any other body.¹¹ One may think that we can at least point to the volume of a stone, but if we cannot articulate which corpuscles make up the stone, we cannot talk of its discrete volume, for the problem of individuation is merely pushed to a deeper level — that of the individuation of corpuscles.

These individuation issues have far-reaching consequences for Descartes’s physics.¹² The issues are problematic, not only because they go against the common sense view that there are individuated bodies that are at rest and in motion, but also because Descartes relies on a distinction between resting and moving bodies when he formulates his laws of impact. If bodies are not individuated, then how can we make sense of Descartes’s account of the third law of motion and the seven rules of collision? In *Principles*, Part II, section 40, Descartes formulates the third law of motion as follows:

11 See Alan Nelson, ‘Micro-Chaos and Idealization in Cartesian Physics,’ *Philosophical Studies* 77 (1995), 5-11, for a discussion of these passages.

12 There are also implications for Descartes’s accounts of the individuation of minds, dualism, the mind-body union, and God’s creation. See Thomas Lennon, ‘The Problem of Individuation among the Cartesians,’ in *Individuation in Early Modern Philosophy: Descartes to Kant*, Kenneth F. Barber and Jorge J.E. Garcia, eds. (Albany: State University of New York Press 1994) for the connection between the individuation of bodies and minds.

[When] a moving body collides with another, if its power of continuing in a straight line is less than the resistance of the other body, it is deflected so that, while the quantity of motion is retained, the direction is altered; but if its power of continuing is greater than the resistance of the other body, it carries that body along with it, and loses a quantity of motion equal to that which it imparts to the other body. (AT VIII A 65; CSM I 242)

Throughout Part II of *Principles*, Descartes again and again refers to individual bodies as if they were in motion and at rest, but without reference to absolute motion and strict individuality of bodies, it does not seem that he has an ontology that can found his physics.

These problems that involve the individuation of bodies lead Garber to the following conclusion:

I shall continue to talk as if Descartes is dealing with a world of individual bodies, colliding with one another, at motion and at rest with respect to one another. But, in the end, I suspect that this is something that he is not entitled to, and this is something that, if true, would seriously undermine his whole program.¹³

Here Garber throws up his hands.¹⁴ According to one of Descartes's most sympathetic commentators, there is no systematic interpretation under which his physics and metaphysics are without fundamental flaws.

III Primary, Secondary, and Tertiary Substances

With Cordemoy, Leibniz, Kenny, and Garber, I agree that local motion cannot individuate Cartesian bodies. Is there another reading of the Cartesian ontology according to which the individuation of bodies is done in some other way? I argue that there is. Notice that all of the paradoxes discussed above involve the following assumption: there must be something mind-independent that individuates Cartesian bodies — Kenny and Cordemoy assume that motion must act as this individuator, and Garber and Leibniz assume that intrinsic features of bodies must individuate them. Put in Cartesian language, their assumption is this: bodies are 'really distinct' from each other in the richest sense, akin to how mind and body are 'really distinct,' and so are 'secondary substances.' This assumption leads these critics to search for a mecha-

13 Garber, *Descartes' Metaphysical Physics*, 181.

14 See Jonathan Bennett, 'Space and Subtle Matter in Descartes's Metaphysics,' in *New Essays on the Rationalists*, Rocco J. Gennaro and Charles Huenemann, eds. (Oxford: Oxford University Press 1999), 16-17, who also dismisses Descartes on this account.

nism in the ontology that individuates bodies into secondary substances, and ultimately to conclude that the ontology is incomplete because no such mechanism can be found. I argue that this approach is flawed because individual bodies are not secondary substances.

In *Principles of Philosophy*, Part I, section 51, Descartes defines 'substance' in terms of 'independence' (AT VIII A 24; CSM I 210), to which he assigns both a strict and a loose sense.¹⁵ The strict sense refers to the only thing that is completely independent: God. The loose sense refers to that which is dependent on God, but is independent of other things: thinking and extended substances. I use 'primary substance' and 'substance_p' for the sense of 'substance' that applies to God. I will use 'secondary substance' and 'substance_s' for the sense of 'substance' that applies to thinking and extended substances. When speaking about substances in a general way, and not about one kind of substance in particular, I use 'substance' with no subscript.

The tricky interpretive questions arise when we consider what the terms 'secondary mental substance' and 'secondary extended substance' refer to. Throughout this paper, I consider only the case of 'secondary extended substance,' leaving open the question about what 'secondary mental substance' refers to. There are several options for the referent of 'secondary extended substance.' On the one hand, it could refer to bodies. If that is the case, then one of two readings may hold: (1) bodies are the only secondary extended substances, in which case the universe as a whole is a sum of the plenum of bodies, but not a substance itself; (2) bodies and the universe as a whole are both secondary extended substances, but impure and pure ones, respectively.¹⁶ On the other hand,

15 There are several senses of the term 'independence_s,' at least two of which are captured by the terms 'causal independence_s' and 'ontological independence_s.' As is apparent below, according to the reading I present in this paper, referents of both of these terms are attributes_s; therefore the causal independence_s and the ontological independence_s of extended substance_s are only conceptually distinct from it and from each other; the analogous point holds for mental substance_s and its attributes_s.

Descartes also defines 'substance' in the Second Replies (AT VII 162; CSM I 114). There he focuses on the relation between substances and attributes. For a discussion of this relation as a criterion for substantiality, see Paul Hoffman, 'Descartes's Theory of Distinction,' *Philosophy and Phenomenological Research* 94 (2001), 58ff., and Matthew Stuart, 'Descartes's Extended Substances,' in *New Essays on the Rationalists*, Rocco J. Gennaro and Charles Huenemann, eds. (Oxford: Oxford University Press 1999), 82-83.

16 Though there are important differences among their accounts, some commentators who roughly fall into this camp are Bennett, 'Space and Subtle Matter,' 10-11; Gregory Brown, 'Math, Physics, and Corporeal Substance in Descartes,' *Pacific Philosophical Quarterly* 70 (1989), 291; Dennis Des Chene, *Physiologica: Natural Phi-*

the referent of 'secondary extended substance' could be the whole extended universe, in which case bodies would have some other ontological status that accounts for their individuality.¹⁷

osophy in Late Aristotelian and Cartesian Thought (Ithaca: Cornell University Press 1996), 367-75; Michael Della Rocca, 'If a Body Meet a Body: Descartes on Body-Body Causation,' in *New Essays on the Rationalists*, Rocco J. Gennaro and Charles Huenemann, eds. (Oxford: Oxford University Press 1999), 48-9; Garber, *Descartes' Metaphysical Physics*, 181; Hoffman, 'Unity,' 347-9; Jeremy Hyman, 'Is There a Special Problem for Descartes about the Real Distinction of the Parts of Matter?' (unpublished manuscript); Kenny, *Descartes*, 214-15; Eric Palmer, 'Descartes on Nothing in Particular,' in *New Essays on the Rationalists*, Rocco J. Gennaro and Charles Huenemann, eds. (Oxford: Oxford University Press 1999), 26-9; Prendergast, 'Descartes and the Relativity of Motion,' 67ff.; Edward Slowik, 'Descartes and Individual Corporeal Substance,' *British Journal for the History of Philosophy* 9 (2001); and Margaret Wilson, *Descartes* (New York: Routledge 1978), 87-8.

- 17 Though there are important differences among their accounts, some commentators who roughly fall into this camp are John Cottingham, *Descartes* (Oxford: Basil Blackwell 1986), 84-8, 212-17; Emily Grosholz, 'Descartes and the Individuation of Physical Objects,' in *Individuation in Early Modern Philosophy: Descartes to Kant*, Kenneth F. Barber and Jorge J.E. Garcia, eds. (Albany: State University of New York Press 1994), 48, 54; Martial Gueroult, *Descartes' Philosophy Interpreted according to the Order of Reasons*, Vol. 1, trans. Roger Ariew (Minneapolis: University of Minnesota Press 1983), 63-74; S.V. Keeling, *Descartes* (Oxford: Oxford University Press 1968), 129-30; Thomas Lennon, 'The Eleatic Descartes' (forthcoming); Thomas Lennon, 'Descartes's Idealism,' in Vol. 4 of *Philosophy and Culture, Proceedings of the XVII World Congress of Philosophy* (Montreal: Editions Montmorency 1988); Thomas Lennon, *The Battle of the Gods and Giants: The Legacy of Descartes and Gassendi* (Princeton: Princeton University Press 1993), 191-210; Geneviève Rodis Lewis, *L'individualité selon Descartes* (Paris: J. Vrin 1950), 46, 51, 60; and Bernard Williams, *Descartes: The Project of Pure Enquiry* (London: Penguin 1978), 126-9. The most developed accounts are by Lennon and Gueroult.

Lennon argues that the whole extended universe is the only secondary extended substance (my terminology), and that it is a kind of motionless Platonic form. According to this account, the ideal extended substance appears to us as if it were divided into individual bodies, themselves merely phenomenally individuated modes of the extended substance. While I find the spirit of this interpretation appealing for reasons discussed below, I resist the following claims involved in Lennon's thesis: extended substance is a kind of Platonic form, all motion is fully ideal, and bodies are merely modes and are not substances at all.

Gueroult also argues that bodies are modes of the one secondary extended substance (my terminology), but he understands this modal status in yet another way. Gueroult holds that things such as sticks, stones, pieces of wood, iron, etc. are aggregates of corpuscles; he also holds that, whereas bodies change their shapes, corpuscles do not (Gueroult, *Descartes' Philosophy*, 297-8, n. 165). He discusses the sense in which bodies have a kind of substantiality, albeit in a 'third-order' sense according to which they imitate secondary substances by being really distinct from each other in a way that roughly corresponds to how secondary substances are

From this point on, I use 'secondary extended substance' in the second way, namely, to refer to the whole extended universe. My strongest argument for interpreting Descartes in this way rests on the work done in this paper as a whole: (1) on this reading of 'secondary extended substance' the puzzles discussed in the literature about Descartes's account of the individuation of bodies do not arise, and (2) on this reading a complete ontology of individual bodies can be given — that is, an account of the sense in which bodies are substances, of how bodies are clearly and distinctly perceived, and of how the real, conceptual, and modal distinctions apply to them. In addition to this systematic argument, there is also at least one passage in Descartes's work that can be seen as directly supporting this reading: in the Synopsis of the *Meditations* Descartes articulates an additional sense of 'substance' that accounts for the substantiality of finite bodies like birds, trees, sticks, and stones. The relevant passage begins with a description of secondary substances:

First, we need to know that absolutely all substances, or things which must be created by God in order to exist, are by their nature incorruptible and cannot ever cease to exist unless they are reduced to nothingness by God's denying his concurrence to them. Secondly, we need to recognize that body, taken in the general sense, is a substance, so that it never perishes. (AT VII 14; CSM II 10)

The referent of 'body, taken in the general sense' is then contrasted with the human body, which is itself contrasted with non-human bodies:

But the human body, in so far as it differs from other bodies, is simply made up of a certain configuration of limbs and other accidents of this sort, whereas the human mind is not made up of any accidents in this way, but is a pure substance. For even if all the accidents of the mind change, so that it has different objects of the understanding and different desires and sensations, it does not on that account become a different mind; whereas a human body loses its identity merely as a result of a change in the shape of some of its parts. (AT IV 14; CSM II 10)

really distinct from each other (63-74). In another work, Gueroult says that bodies are held together by cohesion, a kind of force established by God ('The Metaphysics and Physics of Force in Descartes,' in *Descartes: Philosophy, Mathematics and Physics*, Stephen Gaukroger, ed. (Sussex: Harvester Press 1980), 212.

While I find Gueroult's interpretation appealing, I resist the claim that bodies are composed of a determinate quantity of corpuscles that do not change their shapes. Descartes explicitly argues in *Principles*, Part II, sections 33-35 that there are no such atoms, and also that all bodies are in continual division (AT VIII 58-60; CSM I 237-9). Gueroult, too, finds this endpoint to the division problematic (Gueroult, *Descartes' Philosophy*, 225, n. 53).

Pure substances — individual minds and extended substances — are incorruptible by a change in parts. Impure substances — human and non-human bodies — are corruptible by a change in parts.¹⁸ Because they come into and go out of existence by a change in parts, each body has its own criterion of corruptibility. Thus, impure substances differ from pure substances in two ways: (1) pure substances come into and go out of existence only by means of God's creation and his denial of concurrence, whereas impure substances come into and go out of existence because of changes in parts; (2) pure substances are incorruptible, and so do not differ from each other because of different criteria of corruptibility, whereas impure substances do differ from each other because of different criteria of corruptibility. With this distinction between pure and impure substances, Descartes makes room for a tertiary sense of 'substance' that applies to dependent, corruptible things — bodies.¹⁹ When I refer to one of these bodies, I use the term 'tertiary substance' or 'substance.'²⁰

If we understand independence to correlate with the degree of reality assigned to a substance, we find that these three kinds of substances

18 It may be objected that in this passage Descartes uses the term 'body' as a mass noun rather than a count noun. However, insofar as Descartes explains that what 'body taken generally' refers to has a different criterion of corruptibility than what 'a body' refers to, this passage commits him to two entities, each with its own ontological status.

19 In 'The Unity of Descartes's Man,' Paul Hoffman criticizes Gueroult for using this passage to support the thesis that individual bodies are modes of the indefinitely extended corporeal substance. Hoffman states: 'First, it is not at all clear that Descartes is referring to the extended universe taken as a whole when he says that body, at least taken generally, is a substance ("*corpus quidem in genere sumptum esse substantiam*"). Second, he falls short of saying that individual bodies are modes' (Hoffman, 'Unity,' 348). On the first point, I agree with Hoffman that the passage is indecisive in this way. However, here and elsewhere Descartes does make a distinction between an incorruptible extended substance and corruptible ones. One way to account for that distinction is to understand incorruptible and corruptible substances as substances at two different ontological levels; further, the substance in the weaker, tertiary sense can also be understood as a mode of the secondary substance. On the second point, I agree that Descartes never writes about bodies as modes. However, as I argue below, bodies simply are their sizes, and Descartes does hold that sizes are modes. For some examples of texts that imply that sizes are modes, see *Principles*, Part I, section 48 (AT VIII A, 23; CSM I 208) and section 69 (AT VIII A 33; CSM I 217) where he includes 'size' in a list with 'shape,' 'motion,' and 'position.' Also see *Optics* (AT IV 138-140; CSM I 172).

20 Note that my discussion of tertiary substances differs significantly from John Cottingham's discussion of trialism, in 'Cartesian Trialism,' *Mind* 94 (1985): 118-130, according to which minds, bodies, and men (*qua* embodied beings) have different 'features' particular to them.

correlate with three degrees of reality, and thus with three degrees of individuation: God has the most reality and independence, and he is the most individuated from other substances; minds and the whole extended universe have a secondary degree of reality and independence, and they are individuated from each other in a secondary sense; individual bodies and mind-body unions have the least degree of reality and independence, and they are the least individuated.

IV Three Tiers of Attributes, Modes, and Qualities

I now explore how the rest of Descartes's ontology fits this three-tiered structure by investigating how substances at the different levels have attributes, modes, and qualities. Below, I build on this account by showing how other technical terms — 'clear and distinct perception,' 'real distinction,' 'conceptual distinction,' and 'modal distinction' — also apply to tertiary substances. In both of these discussions, I follow the same conventions I stipulate above for substances. When I use the terms in a general way, I do not use subscripts; when I use the terms to describe how they apply at a particular ontological level, I use subscripts to indicate that level.

There are two different ways of interpreting Cartesian attributes, modes, and qualities. On the one hand, they can be understood as properties that inhere in substrata. Many commentators, from Locke to the present, have understood Descartes in this way, and there is some textual evidence that may support this reading. Consider, for example, Descartes's definition of 'substance' in the Geometrical Exposition: 'This term applies to every thing in which whatever we perceive immediately resides, as in a subject' (AT VII 161; CSM II 114). On the other hand, attributes can be understood as different ways that a substance can be regarded.²¹ Descartes's definitions of 'attribute,' 'mode,' and 'quality' in *Principles*, Part I, section 56 provide some textual support for this reading. Consider these definitions:

[We] employ the term *mode* when we are thinking of a substance as being affected or modified; when the modification enables the substance to be designated as a substance of such and such a kind, we use the term *quality*; and finally, when we

21 Lawrence Nolan, in 'Reductionism and Nominalism in Descartes's Theory of Attributes,' *Topoi* 16 (1997) 129-40, and 'Theory of Universals,' *Philosophical Studies* 89 (1988) 161-80 develops an interpretation along these lines.

are simply thinking in a more general way of what is in a substance, we use the term *attribute*. (AT VIII A 26; CSM I 211; Descartes's emphasis)

Here Descartes defines 'attribute,' 'mode,' and 'quality' as ways we 'think of' substances, not as properties that inhere in a substratum. He says that when we attend to a substance in terms of its being general (that is, unchanging), we find its attributes. When we attend to the substance as if it were affected or modified (that is, as if it were changing), we find its modes. When we attend to the substance as if it were modified in such a way that those modifications enable us to classify the substance as one of a certain kind, we find its qualities. Thus we 'find' what the attributes, modes, or qualities are. Of course, what we 'find' is based on a combination of some constraints grounded in the substance in question and other constraints grounded in the particularities of our finite minds. For instance, because we are finite creatures, and thus are able to regard substances as changing, we are able to find modes; because extended substance is purely geometrical, the only modes that we will be able to find are geometrical ones.

Given these definitions of 'attribute,' 'mode,' and 'quality,' consider how they apply to God. Because of his simplicity, God does not admit of change, and so we cannot regard him as unchanging. So God does not have modes or qualities.²² Instead, God has attributes_p only, all of which are his perfections_p. We cannot produce an exhaustive list of God's attributes_p, for any way of regarding God as unchanging reveals another one of his attributes_p (analogous points hold for the lists of attributes, modes, and qualities of substances at all ontological levels). Some of his attributes_p are independence_p, perfection_p, simplicity_p, infinity_p, eternity_p, immutability_p, supreme intelligence_p, supreme power_p, supreme goodness_p, and necessary existence_p (AT VII 45, 50, 68-69; CSM I 31, 34, 47-48).²³

Now consider extended substances_s. When we regard extended substances_s in terms of what is general and unchanging in it, we find that the independence_s, existence_s, and duration_s of secondary extended sub-

22 See *Principles*, Part I, section 56: 'We do not, strictly speaking, say that there are modes or qualities in God, but simply attributes, since in the case of God, any variation is unintelligible' (AT VIII A 26; CSM I 211).

23 I read the Cartesian meditator's realization that God is not a deceiver (AT VII 69-70; CSM II 48) as an implicit realization that God is supremely good_p. Notice that God's goodness_p can be discovered by regarding God as immutable_p in that when one understands God as immutable_p, one also understands God as perfect_p, and that deception — the negation of goodness_p — involves imperfection.

stance remain unchanging, and therefore they are attributes.²⁴ Quantity of extension_s is an attribute_s because we must regard it as unchanged: the indefinite amount of extension_s that God creates always remains the same because God creates extended substance_s in one simple act; he does not create some extension_s at one time and more at a later time.²⁵

There is another contender for being an attribute_s of extended substance_s, a contender that has been *entirely* unappreciated in the secondary literature. This is the quantity of motion_s in extended substance_s.²⁶ In *Principles*, Part II, section 36, Descartes states explicitly that the quantity of motion_s remains unmodified in extended substance_s:

In the beginning <in his omnipotence> [God] created matter, along with its motion and rest; and now, merely by his regular concurrence, he preserves the same amount of motion and rest in the material universe as he put there in the beginning. (AT VIII A 61; CSM I 240)²⁷

Since the quantity of motion_s in extension_s must be regarded as unchanging, it too is an attribute_s.

Now consider the modes_s of extended substance_s. Descartes includes the following terms in his frequent lists of the modes of body: 'size,' 'shape,' 'position,' 'local motion,' and 'surface.'²⁸ *Prima facie*, 'body' ambiguously refers to both extended substance_s and extended substance_t. But the referent of 'body' cannot be extended substance_s because

24 See *Principles*, Part I, section 56: '[In] the case of created things, that which always remains unmodified — for example existence and duration in a thing which exists and endures — should be called not a quality or a mode but an attribute' (AT VIII A 26; CSM I 211-212).

25 Extension_s also plays the unique role of being a principal attribute_s. See *Principles*, Part I, section 26 (AT VIII A 15; CSM I 202) for Descartes's account of the indefinite extension_s of the universe. See *Principles*, Part I, section 23 (AT VIII A 14; CSM I 201) for an account of God's creation.

26 Though many commentators have noted the role that quantity of motion plays in Descartes's physics, no one has understood it as an attribute_s of secondary extended substance.

27 Cottingham, Stoothoff, and Murdoch (see CSM I is) use diamond brackets to indicate a translation that involves the addition of a term or phrase from an early translation approved by Descartes.

28 Consider the passages where Descartes writes about the following as modes: shapes and motions (AT VIII A 25; CSM I 210-211), positions and sizes (AT VIII A 48; CSM I 229), surfaces and shapes (AT IV 163-164; CSMK 241), surfaces and motions (AT IV 187; CSMK 248), sizes, shapes, motions, and positions (AT VIII A 23; CSM I 209), and shapes, positions, and motions (AT VIII A 32; CSM I 216).

size, shape, position, motion, and surface cannot be modes_s of extended substance_s; if they were modes_s, then tensions would arise with Descartes's account of the attributes_p of God and the attributes_s of extended substance_s. For example, if we could regard the size of extended substance_s as changing, then size would be one of its modes_s. However, given that all of extended substance_s is created by God all at once, extended substance_s does not have a changing size; we cannot even regard extended substance_s as having a changing size because in doing so we would have to attribute variation to God, an attribution that would be in tension with God's simplicity_p. For similar reasons, shape, position, motion, and surface are not modes_s of extended substance_s. We cannot regard extended substance_s as having a shape, much less as having a changing shape, because extended substance_s is indefinitely extended. Further, we cannot regard it as having a position or motion with respect to other extended substances_s, or as having a surface that is between it and another extended substance_s, because there is only one extended substance_s.²⁹ So size, shape, position, motion, and surface are not modes_s of extended substance_s.

What are the modes_s of indefinitely extended substance_s? Given that we find the modes of a substance when we regard it as changing, the question can be rephrased in this way: how can we regard extended substance_s as changing? Either extended substance_s does not have modes_s, or there is some other way of regarding extended substance_s as changing that is not in tension with its attributes_s.

Consider the following solution: we find the modes_s of extended substance_s when we regard it *as if it were* divided into parts that are changing with respect to each other. In this way, we find the modes_s of extended substance_s when we regard extended substance_s as having *internal variation*, that is, as being divided into bodies that change with respect to each other. Thus bodies are modes_s of secondary extended substance. On this reading, secondary extended substance itself does not vary; to claim that it does is to maintain that it is *actually* divided into parts. However, though secondary extended substance is not actually divided, we can regard it as divided and thus as varied, as we do all of the time when we perceive the physical world as full of objects marked by difference with

29 In *Principles*, Part II, section 13 Descartes explains that all positions are relations among bodies (AT VIII A 47; CSM I 228). In *Principles*, Part II, section 25, he explains that a body is in motion when it changes in relation to its neighborhood (AT VIII A 53-54; CSM I 233). He defines 'surface' as a boundary in *Principles*, Part II, section 13 (AT VIII A 48; CSM I 229) and also in the Fourth Replies (AT VII 250-251; CSM I 174).

respect to color, smell, size, shape, motion, etc. Thus when we regard secondary extended substance modally, that is, as having internal variation, we find that its modes_s are individual bodies. Notice that this is what makes the view a phenomenalist one: in order for there to be flux in the universe and for secondary extended substance to remain unchanging, bodies must get their precise delimitations from perceivers.³⁰

Given that bodies are modes_s of secondary extended substance_s, bodies have an ontological status at both the secondary and tertiary levels — in addition to being substances_t, bodies are also modes_s. At the secondary level, bodies are modes_s that are discovered when perceivers regard secondary extended substance as having internal variation. At the tertiary level, bodies are substances_t that depend_t on secondary extended substance for their extension_t, and on perceivers for their precise delimitations.

Though extended substance_s has attributes_s and modes_s, it does not have qualities_s. The qualities of a substance are particular kinds of modifications that we regard the substance as having — namely, those that also allow us to designate the substance as being a substance of a certain kind. But we classify the extended universe as being the kind of substance it is — extended substance_s — because of its attributes_s, not because of the modifications that we regard it as having.

Now consider the attributes_t, modes_t, and qualities_t of tertiary substances. As discussed above, in the Synopsis passage Descartes maintains that individual bodies each have their own criteria of corruptibility_t. Because we can regard bodies as unchanging with respect to their corruptibility_t, corruptibility_t is an attribute_t. Note also that bodies are independent_t of each other in virtue of this corruptibility_t; given that this independence_t is unchanging, it too is an attribute_t. But in addition to being independent_t of each other, bodies are dependent_t on secondary extended substance and perceivers, as discussed above; this is what makes their independence merely tertiary. Because we can regard bodies as unchanging by attending to them in terms of their existences_t and durations_t, these too are attributes_t. Further, given that bodies have finite extensions, they always have some size, shape, position, local motion (or rest), and surface or other. Thus, having some size or other is an attribute_t, and having some shape or other is an attribute_t, and so on. Further, because we can regard bodies as having changing sizes_t, shapes_t, positions_t, local motions_t (or rest_t), and surfaces_t, these are

30 In the section below on Cartesian physics, I discuss this view in light of *Principles* Part II, section 23; I argue that on the correct reading of this passage, it does not conflict with the reading given in this paper.

modes_t. We also regard bodies as having changing colors_t, smells_t, tastes_t, feels_t, and sounds_t. However, these are not modes. When we regard bodies in terms of colors_t, etc., we classify the bodies as substances_t of a certain kind, e.g., as a piece of wax instead of a piece of wood. So color_t, smell_t, taste_t, feel_t, and sound_t are qualities.

Of course, modes_t and qualities_t each have a different ontological status with respect to their dependence_t on perceivers and tertiary extended substances. One way of putting this point is to say that whereas qualities_t are purely mind-dependent_t, modes_t are mind-dependent_t in one respect and mind-independent_t in another. Consider the example of a yellow ball that is rolling down an incline, and the perceiver who is observing it. What makes the perceiver's perception of the motion_t (a mode_t) of the ball rolling down the incline 'correct,' but her perception of the yellowness_t (a quality_t) of the ball 'incorrect' is that ball's motion_t, unlike its yellowness_t, is ultimately based in an attribute_s of secondary extended substance — namely, the quantity of motion_t in the universe. The yellowness_t, on the other hand, is *not* based in an attribute_s of secondary substance. Thus whereas colors_t are completely mind-dependent_t, motions_t are both *mind-independent_t* — they would not exist_t if God had not put a quantity of motion_s into the universe — and *mind-dependent_t* — they depend_t on a perceiver to regard the world as divided into objects with sizes_t, shapes_t, surfaces_t, positions_t, and motions_t.³¹ Thus there is a direct relation between motion_t and quantity of motion_s: motion_t is a delimitation of quantity of motion_s.

This point about the relation between the quantity of motion_s and the local motion_t is important, particularly when interpreting Descartes's account of how God maintains the quantity of motion_s in the universe, and its implications for the bodies that have local motions_t. On the reading I present in this paper, God maintains the quantity of motion_s in the universe in the following sense: God creates and conserves secondary extended substance such that it manifests itself to us as maintaining a constant amount of motion_t of individual bodies. That is, however we choose to regard secondary extended substance as divided into bodies — e.g., as planets in heavens, as sensible medium-sized objects, or as insensible globules that compose all objects — there is a conformity over time in the amount of the amount of local motion_t among bodies of that

31 Another way of putting this point about mind-dependence and mind-independence is in terms of what is subjective and objective. Put in such language, my point is this: bodies are objective in that they are dependent_t on secondary extended substance for their extension; they are subjective in that they are dependent_t on perceivers for their precise delimitations.

size. That is, there aren't any gaps in the amount of motion_t from one moment to the next among bodies of similar sizes: when one body comes to rest_t, another gains motion_t. Thus my interpretation differs starkly from the 'realist' interpretation, according to which bodies are secondary substances. On the realist interpretation, the quantity of motion in the universe is a direct sum of the motions of individual bodies; God maintains this sum by simultaneously stopping the motion of some bodies while starting or increasing the motion of others. However, this reading is in tension with what Descartes says about God. As discussed above, Descartes specifically says that God cannot be directly involved in variation; but the realist reading requires that God perceives and regulates individual changes. My reading — which, is a kind of phenomenalist reading — reserves all flux, as well as the observation of it, to the secondary and tertiary levels, which are the realms of created entities.

V Clear and Distinct Perceptions_t; Real, Conceptual, and Modal Distinctions_t

I now consider how Descartes's theory of distinctions and his theory of clear and distinct perceptions apply to his ontology of individual bodies. I begin with the theory of distinctions, first making several general points about the real, conceptual, and modal distinctions, then discussing how these distinctions apply at the tertiary level. I then give an analysis of tertiary clear and distinct perceptions, and discuss the implications of this analysis for the tertiary distinctions.

When Descartes defines 'clear and distinct perception' in *Principles*, Part I, section 45, he says that a perception gets more clear and distinct when we separate it from others. This process of separating ideas, which Descartes also calls 'distinguishing' in *Principles*, Part I, section 63, is done by one of two mental operations: exclusion or abstraction. These are the same mental operations that we use to discover the real, conceptual, and modal distinctions.

Descartes characterizes the real distinction as a distinction between substances that is discovered by exclusion, a mental process that he also describes as a kind of denial.³² The most commonly cited use of exclusion

32 In *Principles*, Part I, section 60 (AT VIII A 28; CSM I 213), Descartes explains that the real distinction is discovered by exclusion. Descartes sometimes uses the Latin and French cognates of 'exclude' and 'deny' as synonyms. For example, in Rule 14 (AT X 445; CSM I 61) Descartes uses the Latin terms *excludere* and *negare* synonymously; also see the letter to Gibieuf (AT III 475; CSMK 202) where he uses the French term

in Descartes's work is in his discussion in the Sixth Meditation of the real distinction_s between mental and extended substances_s. The discovery of the real distinction_s can be roughly described in the following way. First, we think of mental substance_s and exclude the existence of extended substance_s from it, thus forming a clear and distinct perception_s of mental substance_s; then we think of extended substance_s and exclude the existence of mental substance_s from it, thus forming a clear and distinct perception_s of extended substance_s.³³ In doing both of these, we mutually exclude the two substances_s from each other.³⁴ When we couple these clear and distinct perceptions_s with the understanding that God can bring about anything of which we have a clear and distinct perception_s, we discover the real distinction_s between the two substances_s.

Whereas real distinctions are found by mutual exclusions, modal distinctions are found by one-way exclusions. Descartes explains in *Principles*, Part I, section 61, that when we can clearly and distinctly perceive a substance while excluding one of its modes, and when we *cannot* clearly and distinctly perceive a mode while excluding the substance from it, we discover a modal distinction (AT VIII A 29-30; CSM I 213-14).³⁵

Unlike the real and modal distinctions, both of which involve exclusion, the conceptual distinction involves the other mental operation — abstraction. Descartes explains in *Principles*, Part I, section 62, that when we use abstraction to form a clear and distinct perception of a substance, we selectively attend to the substance (AT VIII A 30; CSM I 214). For example, when we attend to extended substance_s in terms of quantity of motion_s, we may ignore indefinite extension_s, and in doing so we abstract quantity of motion_s from indefinite extension_s. The conceptual distinction should be understood as a distinction in the following sense: it is the distinction between the two ways we come to form a clear and distinct perception about a substance. That is, the two ways of forming a clear

nier when explaining how one can perform a faulty abstraction by denying an attribute of a substance although the attribute is rightly associated with that substance.

33 See the famous passage in the Sixth Meditation where Descartes perceives the real distinction_s between mental and extended substance_s (AT VII 78; CSM II 54).

34 I follow Norman J. Wells, in 'Descartes on Distinction,' in *Quest for the Absolute*, ed. Frederick Adelman (Chestnut Hill: Boston College 1966), 112, in using the term 'mutual exclusion.'

35 Descartes also discusses a second kind of modal distinction (AT VIII A 29-30; CSM I 214).

and distinct perception of the substance are the two attributes.³⁶ Thus attributes are not properties inhering in a substance, and so are not separate 'things'; instead, the attributes of a substance are different ways we can clearly and distinctly regard the substance as unchanging.³⁷

Equipped with this (cursory) account of the real, conceptual, and modal distinctions, I now consider how each distinction applies to individual bodies. Given that bodies are both substances_t in their own right, and also modes_s of extended substance_s, I give a dual analysis.

Insofar as bodies are modes_s, they are modally distinct_s from each other and from extended substance_s. The modal distinction_s holds because (1) we can clearly and distinctly perceive_s extended substance_s while excluding individual bodies (because we can regard extended substance_s as unchanging), and (2) we cannot clearly and distinctly perceive_s individual bodies while excluding extended substance_s from them (because we must understand individual bodies as dependent_t on extended substance_s).

Insofar as bodies are substances_t, they are really distinct_t from each other, conceptually distinct_t from their attributes_t, and modally distinct_t from their modes_t. First, consider the conceptual distinction_t. We discover that a piece of wax and its duration_t are conceptually distinct_t because we can attend to a piece of wax while ignoring its duration_t, but we cannot attend to the piece of wax while excluding its duration_t. The same holds for the piece of wax and its attribute_t of having some shape or other. Another way of putting this is to say that there can be no finite body without some shape, and no shape without some body.

Now consider the modal distinction_t. We discover that the piece of wax and its specific shape_t are modally distinct_t because we can attend to the piece of wax while denying that it has the shape_t that it has. That is, we can imagine that it has some shape, but we cannot attend to the shape_t while denying that it is the shape_t of a body (which is, in this case, the piece of wax).

36 The attributes cannot be reduced to modes of our mind, because then they would be modes and so modally distinct (AT VI 350; CSMK 280). They cannot be two different parts of the substance because Descartes says that substances don't have parts; he makes this point when he explains that the essence and existence of a substance are 'in no way distinct' in substances (AT VI 350; CSMK 280).

37 This view is similar in spirit to Nolan's in 'Reductionism and Nominalism.' For a quite different interpretation of Descartes's theory of distinctions, see Paul Hoffman, 'Descartes's Theory of Distinction,' *Philosophy and Phenomenological Research* 94 (2002) 57-78.

Now consider the real distinction_t. There are three relevant passages. One is in *Principles*, Part I, section 60: ‘And we can also be certain that, if [corporeal substance] exists, each and every part of it, *as delimited by us in our thought*, is really distinct from the other parts of the same substance’ (AT VIII A 28; CSM I 213; emphasis mine). Another is in a letter to Gibieuf: ‘From the simple fact that I *consider* the two halves of a part of matter, however small it may be, as two complete substances ... I conclude with certainty that they are really divisible’ (AT III 477; CSMK 202-203; emphasis mine).

I interpret these first two passages as follows. In the *Principles* passage, Descartes uses ‘corporeal substance’ to refer to secondary extended substance, and he uses ‘part’ to refer to individual bodies — what we find when we regard the secondary extended substance as having internal variability. Here Descartes is explicit about the role we play in ‘delimiting’ these bodies, and also about how these bodies are really distinct_t from each other. In the letter to Gibieuf, he says that we can consider ‘a part of matter’ as having halves that are ‘really divisible.’ By ‘matter’ he refers to secondary extended substance, and by ‘a part of matter’ he refers to the bodies that we discover when we regard secondary extended substance as having internal variability. In saying that the halves of a part of matter are ‘really divisible,’ he means that we can regard a body as being composed of smaller bodies, ones that are themselves tertiary substances and really distinct_t from each other.

The third passage in which Descartes discusses the real distinction_t between tertiary substances is in *Principles*, Part I, section 61. After articulating the two kinds of modal distinction, he states:

A different case, however, is the distinction by which the mode of one substance is distinct from another substance or from the mode of another substance. An example of this is the way in which the motion of one body is distinct from another body, or from the mind; or the way in which motion differs from doubt. It seems more appropriate to call this kind of distinction a real distinction, rather than a modal distinction, since the modes in question cannot be clearly understood apart from the really distinct substances of which they are modes. (AT VIII A 30; CSM I 214)

When we clearly and distinctly perceive_t a mode_t of one body apart from — that is, in exclusion from — a mode_t of another body, and vice versa, we perceive the real distinction_t between the two bodies. For example, when we mutually exclude the particular cylindricality_t of a stick and the particular position_t of a piece of wax, we perceive the real distinction_t between the stick and the piece of wax.

This concludes my reconstruction of Descartes’s ontology. I have shown that we can consistently categorize Cartesian substances as primary, secondary, or tertiary substances; and also that substances at each level have attributes, modes, and qualities. I have also discussed how

tertiary substances can be clearly and distinctly perceived_t, and show how the real, conceptual, and modal distinctions_t apply to them.

VI Tertiary Bodies and Cartesian Physics

I point out above that the problems commentators have seen in Descartes's account of the individuation of bodies are based in the assumption that bodies are secondary substances, and so are really distinct from each other in the secondary sense. I argue that bodies are not individuated as secondary substances, but rather as tertiary ones. According to this thesis, bodies — and also their local motions_t and rest_t — are individuated when perceivers regard the secondary extended substance as divided into individual tertiary substances. In other words, the individuation of bodies is mind-dependent. Bodies are tertiary substances, and so are not the kinds of things that have robust individuality, as do primary and secondary substances. On the strictest characterization, bodies are not substances at all; instead, they are only secondary modes. Only at the tertiary level are bodies substances; at this level, they and their attributes_t — having some size_t, shape_t, position_t, local motion_t, and surface_t — are conceptually distinct_t from each other. Not one of these attributes_t is ontologically prior to the others, and thus not one of them can act as the individuator_t of the others.

This account of the tertiary status of bodies is consistent with the definition of 'local motion_t' that Descartes gives in *Principles*, Part II, section 25. The reading I give above does not establish motion as the individuator of bodies; rather, it gives a characterization of motion_t as a mode_t of bodies in that it points out the degree to which both motion_t and bodies are mind-dependent, since both depend on perceivers regarding the secondary extended substance as having internal variation. Recall the passage:

[Motion] is the transfer of one piece of matter, or one body, from the vicinity of the other bodies which are in immediate contact with it, and which are regarded as being at rest, to the vicinity of other bodies. By "one body" or "one piece of matter" I mean whatever is transferred at a given time, even though this may in fact consist of many parts which have different motions relative to each other. (AT VIII A 53-54; CSM I 233)

Whether or not there is a body — a substance_t — depends on how the perceiver regards many smaller bodies and their motions (and, of course, how she or he regards them also depends on her or his perceptions). Whether or not a body is in motion or is at rest depends on how the perceiver regards the now individuated body with respect to other bodies that she or he regards as individuated. This way of characterizing

motions as modes_t and bodies as substances_t fits with the rest of the Cartesian ontology: bodies and their sizes_t, shapes_t, positions_t, local motions_t, and surfaces_t are individuated only in the sense that we regard secondary extended substance as divided into parts, parts that we consider really distinct_t from each other.

A question may occur to the reader: are motion_t and bodies_t 'real' enough to do the work required of them by Cartesian physics? Garber, for instance, holds that local motion must be 'real' because it is supposed to be explanatory. Thus, it 'must *really be* in a body, as a mode' and it must be 'a real fact of the matter' about a body.³⁸

To this I have two replies. First, the account Garber himself gives does not resolve this problem. Though Garber gives an impressive account of the reality of local motion (170-171), the account is ultimately insufficient because, as I discuss above, it is not coupled with an account of the individuation of bodies — the substances of which motions are the modes.

Second, Descartes's physics does not require local motion to be 'real' in the strict secondary sense. I show this by examining *Principles*, Part II, section 23:

All the properties which we clearly perceive in [the matter existing in the universe] are reducible to its divisibility and consequent mobility in respect of its parts, and its resulting capacity to be affected in all the ways which we perceive as being derivable from the movement of the parts. If the division into parts occurs simply in our thought there is no resulting change; any variation in matter or diversity in its many forms depends on motion. (AT VIII A 52-3; CSM I 232)

Each of the two sentences in this passage deserve attention. In the first sentence, note that when Descartes names the tools he will use to describe phenomena, he refers to modalities: to divisibility, not to actual divisions; to mobility, not to actual motions; to capacity for affections, not to actual affections. Therefore, the explanations that Descartes seeks in his physics need not be in terms of 'facts' about bodies, but in terms of the *divisibility* and *mobility* of extended substances_s. This implies that the tools used in this physics are the modes_s, as I describe them above: the individual bodies that we find when we regard the extended universe as internally variable. These modes_s can also be viewed as substances_t with attributes_t and modes_t of their own.

Now consider the second sentence in the passage above. On first glance, this line — which seems to imply that bodies that are individu-

³⁸ Garber, *Descartes's Metaphysical Physics*, 163.

ated in thought are irrelevant to physics — is in tension with my view, according to which all bodies are individuated in thought. Notice, however, that Descartes says that the bodies that are irrelevant to physics are the ones ‘simply’ individuated in thought; the Latin reads *solâ cogitatione*, which is translated into English as ‘in our thought alone.’³⁹ But on my reading, the ‘division into parts’ and the mobility of those parts do not *simply* depend on *our* thought, but depend on God. Given that God has created an indefinitely extended universe_s with a quantity of motion_s, the divisions_t and local motions_t that we perceive in the extended universe ultimately depend on God, who put motion_s into the universe. Local motions_t gain part of their reality from how we regard the extended universe_s as divided into individual bodies with sizes_t, shapes_t, positions_t, local motions_t, and surfaces_t; but this way of regarding the extended universe_s is not random, it depends on how God creates and conserves secondary extended substance. Had God created the extended universe_s as indefinitely extended_s, but without a quantity of motion_s, we would not be able to regard it as divided into bodies with local motion_t.

Further, on this account of the tertiary status of bodies, Descartes’s collision laws are perfectly consistent with his metaphysics. Recall that Descartes’s goal in developing his physics is to give an account that is clear and distinct. Under my interpretation, Descartes formulates the laws in his physics in terms of individual bodies — substances_t — and their modes_t, all of which can be clearly and distinctly perceived_t. Insofar as substances_t, rest_t, and motion_t can be clearly and distinctly perceived_t, Descartes has accomplished his goal.⁴⁰

VII Conclusion

Most commentators approach Descartes’s physics with the assumption that individual bodies are secondary substances; because of this assumption, they find problems throughout Descartes’s account of bodies. I argue instead that we understand individual bodies as tertiary substances, the whole extended universe as a secondary substance, and God as a primary substance. I explain how tertiary substances can be clearly

39 I thank one of the anonymous reviewers for this point about the translation.

40 This view runs parallel to that developed by Alan Nelson in his discussion of the relation between the Cartesian laws of physics and the innate ideas of rational beings (Nelson, ‘Micro-Chaos,’ 10).

and distinctly perceived_t. I also explain how they are really distinct_t from each other, modally distinct_s from secondary extended substance, conceptually distinct_t from their attributes_t and modes_t, and modally distinct_t from their modes_t.

Tertiary extended substances are unique in that on the one hand they are dependent_t on secondary extended substance for their extension_t, and on the other hand they are dependent_t for their individuality_t on how perceivers regard secondary extended substance. In this way, individual bodies differ from the whole extended universe_s, which is completely independent_s — and so really distinct_s — from minds; that is, individual bodies are partially dependent_t on perceivers. The individuation_t among tertiary substances comes about because perceivers regard the secondary extended substance as internally variable — as if it were divided into individual bodies with local motions_t, sizes_t, shapes_t, positions_t, and surfaces_t. Although the individuality_t of bodies is partially mind-dependent, quantity of motion_s and extension_s are not at all mind-dependent: the whole extended universe is independent_s of minds.

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