Divisibility and Cartesian Extension

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I. INTRODUCTION

Descartes’s rejection of the possibility of atoms and the void is rooted in his theory of corporeal substance. There can be no atoms—bodies that are utterly indivisible—because the essence or nature of corporeal substance or body is to be extended, and such a thing is ‘divisible by its very nature’ (Principles ii. 20; AT viiiia. 51–2, CSM i. 231–2). Further, if we understand vacuum in what Descartes calls the ‘philosophical sense’—as the absence of substance—there can be no void or vacuum because extension is something real, a real attribute, and a real attribute must be the attribute of a real something (Principles ii. 16, 17; AT viiiia. 48–50; CSM i. 229–30). So given an extended, apparently empty space, since it is extended in length, breadth, and depth, it cannot be an extended nothing, but must be a something. It is not a vacuum (an extended nothing), but a corporeal substance—as much a corporeal substance as the sensible bodies bounding the apparently empty gap.

One important principle that appears to underlie Descartes’s theory of substance is:

(P1) All substances are incorruptibles.¹

Descartes invokes (P1) in the ‘Synopsis’ of the Meditations, writing: ‘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’

¹ Descartes may have held a stronger version of (P1), which could be expressed in biconditional form:

For all $x$, $x$ is a substance if and only if $x$ is incorruptible.

But, to make our point, we need attribute to him only the weaker (P1).
(AT vii. 14; CSM i. 10). In the Second Replies he says that we have no 'convincing evidence or precedent to suggest that any substance can perish' (AT vi. 153; CSM i. 109). And concerning corporeal substance, he says that 'body, taken in the general sense, is a substance so that it too never perishes' (AT vii. 14; CSM i. 10). A second principle is:

(P2) All incorruptibles are indivisibles.

Corruption, as opposed to the annihilation that would follow from God's withholding concurrence, can only be the division and rearrangement or dispersal of parts. What might seem to have escaped Descartes's notice is that (P1) and (P2) entail:

(P3) All substances are indivisibles.

If (P3) is true, and body or corporeal substance is by its very nature indivisible, it follows that it is not a substance after all. It would then appear that the principles upon which Descartes builds his view of corporeal substance and his subsequent rejection of the possibility of atoms and the void are inconsistent. If inconsistency can be avoided here, it seems we need to clarify different concepts of division and substance. We need a sense in which body 'in general' is indivisible (like a mind) and correspondingly substantial, and another sense in which bodies are naturally divisible (quite unlike a mind), yet correspondingly substantial.

Descartes's writings are notoriously sparse and difficult on this and related issues. This chapter attempts to bring out some less appreciated facets of Descartes's arguments by interpreting them in the context of others who wrestled with closely allied issues. At first this strategy might seem unpromising, because arguments from other philosophers with highly divergent systems begin with something like the Cartesian conception of extended substance, and conclude instead that it is by nature indivisible. As examples, we have the atomist Charleton and the anti-atomist Spinoza both insisting (in very different ways) that an extended plenum is indivisible. We begin by considering these superficially anti-Cartesian arguments in some detail. This background points the way to a reading of Descartes's texts that show he, too, has available a technical sense of 'divisible' in which body is indivisible. Understood in this 'general sense', extension is, therefore, a substance (AT vii. 14; CSM i. 10). Next, we reconstruct the arguments from some critical texts of Descartes's to work up the second sense of 'divisible' that allows him to say that body is nevertheless divisible by its very nature. We contend that the two concepts of divisibility are compatible. The result is a coherent interpretation of Descartes's metaphysics of extension, albeit one whose coherence stands or falls with the controversial reading in which there is, in a specified strict sense, exactly one extended substance.

In Section 2, we draw from Charleton a clarification of one crucial conceptual connection between divisibility and vacuum. Section 3 develops what we take to be Cartesian arguments found in Spinoza that conceptually connect divisibility with the metaphysics of substance and mode. Finally Section 4 argues that, in light of this background, some of Descartes's arguments are clarified and strengthened.

2. DIVISIBILITY AND VACUUM

The connection between the concepts of indivisibility, incorruptibility, and substance runs deep in the history of philosophy. Most metaphysical systems take a definite stand on (P1), (P2), and (P3). For instance, Epicurus argues from (P3) and the assumption that the material world is real (substantial) to the conclusion that matter cannot be infinitely divisible. Leibniz, on the other hand, in holding that...
Cartesian extended being would be infinitely divisible, argues from (P3) that it is not substantial. He establishes substance in his metaphysics by way of the *monad*—an incorporeal being that is indivisible. Descartes, as we know, holds that the material world is substantial, and so incorruptible, and yet holds that it is divisible. This, as was noted above, appears to be inconsistent. For, in holding that body is divisible, it follows from (P3) that body is not a substance.

The connection between the concepts of indivisibility, incorruptibility, and substance in metaphysics goes back at least to Parmenides. His metaphysics is based on a distinction between *Being* and *Non-Being*. Concerning *Being*, he says that it is "unchanged and imperishable", and is "whole and of a single kind". It is "all together, one, and continuous." "Thus," he argues, "it must either be completely or not at all." It is indivisible and full, for what is drawn near to what is." This is in strict contrast to *Non-Being*, which is not and cannot ever come to be. Parmenides' account of *Being* looks as though he understood it to be plenum-like. It is whole, continuous, and indivisible. Real division, it seems, would separate the division of divided regions of *Being* by inserted regions of *Non-Being*. But, "existent regions of *Non-Being*" is nonsense. For, insofar as a region is or exists it is (or has) *Being*. *Being* cannot be divided by way of what is not, for it draws near to what is. And so, since it cannot be divided, it cannot be corrupted. It is, as he says, "impossible for it not to be."\(^5\)

Zeno, a student of Parmenides, argued that the sort of metaphysical view held by his teacher entailed that motion, coming-to-be, ceasing-to-be, and change are all impossible.\(^6\) Explanations of such phenomena were in the end philosophically moost. Epicurus drew from the earlier atomism of Democritus to develop a system of explanation that both met the metaphysical criteria of Parmenides and repudiated the conclusions drawn by Zeno.\(^7\) Epicurus had argued that matter cannot be infinitely divisible, for, if it were, all things would simply 'go to waste into the non-existent'.\(^8\) If the physical world is real, there must exist a smallest hunk of material stuff, a level of material reality that cannot be divided—the *atraeca*—that is, the bottom or the substance of the physical universe.

The atom and the void are the Epicurean counterparts to Parmenides' *Being* and *Non-Being*. The combination of the atoms accounts for a thing's coming-to-be, the replacement of atoms by other atoms accounts for a thing's changing, the dissolution of the combination of atoms accounts for a thing's ceasing-to-be, and the void accounts for the possibility of motion. And so Epicurus argues, against Zeno, that Parmenides' metaphysical categories of *Being* and *Non-Being* do not necessarily entail the impossibility of motion, coming-to-be, ceasing-to-be, and change.

Gassendi is taken by many to be largely responsible for the revival of Epicurean atomism in the seventeenth century. One of his many challenges was to show how this ancient system was compatible with Christianity. Epicurus maintained not only that the atoms were eternal (they were never created nor could they ever perish), but also that they constituted even the gods. Gassendi rejected both claims, holding that God created the atoms (and alone can destroy them) and that God was not constituted of them. He thus seems to have taken the modal import of 'indivisible', and hence 'ingenerable' and 'incorporeal', to be limited to the natural or physical world. That is, the atoms were indivisible, and hence ingenerable and incorporeal in the sense that no natural or created physical thing or process could divide, create, or corrupt them.\(^9\)

Here, a difficulty arises. For even the anti-atomist Descartes was friendly to this sort of view: Even if we imagine that God has chosen to bring it about that some particle of matter is incapable of being divided into smaller particles, it will still not...

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\(^6\) Fragment 296, RKS 249.  

\(^7\) Fragment 296, RKS 250.

\(^8\) Fragment 296, RKS 250–1. It seems that 'near' means 'adjacent' in this context.

\(^9\) Fragment 291, RKS 241.  

\(^10\) Fragment 291, RKS 245.


be correct, strictly speaking, to call this particle indivisible. For, by making it indivisible by any of his creatures, God certainly could not thereby take away his own power of dividing it, since it is quite impossible for him to diminish his own power. (Principles ii. 20; AT viii. 51; CSM ii. 231)

Here, he says that it is only in our epistemically unreliable imaginations that we picture God’s having created particles that cannot be divided by natural means. But we understand they are nevertheless divisible when we form distinct perceptions in our intellects. Their divisibility, by the power of God anyway, is guaranteed by the fact that they are extended, for we distinctly conceive extension as divisible.

In other places, Descartes says that the concept of the atom is a flat contradiction. For instance, to Mersenne he writes:

First of all, an atom can never be conceived distinctly, since the very meaning of the word involves a contradiction, that of being a body and being indivisible. (AT iii. 192; CSMK iii. 154)

To Gibeau he writes:

In the same way, we can say that the existence of atoms, or parts of matter which have extension and yet are indivisible, involves a contradiction, because it is impossible to have the idea of an extended thing without also having the idea of half of it, or a third of it, and so conceiving it as being divisible by two or three. (AT iii. 477; CSMK iii. 202)

And to More he writes:

In the same way [that the possibility of a vacuum is shown to be a contradiction] I say that it involves a contradiction that there should be any atoms which are conceived as extended and at the same time indivisible. Though God might make them such that they could not be divided by any creature, we certainly cannot understand that he might deprive himself of the power of dividing them. (AT V 273, CSMK iii. 363)

Although strictly speaking the concept of the atom is contradictory, we can nevertheless imagine that God brings it about that there be naturally indivisible particles. Even so, as was stated above, the trouble lurking here is that Descartes’s anti-atomism seems to be compatible with Gassendi’s atomism. For the latter to be rightly contrasted with

the former, it seems that there must be a stronger sense of ‘indivisible’ available to the atomist.

In 1654 Walter Charleton published Physiologia Epicuro-Gassendia-Chattoniana: or Fabric of Science Natural, Upon the Hypothesis of Atoms [Physiological], an influential study of Gassendi’s natural philosophy as rooted in the atomism of Epicurus. Concerning the two fundamental metaphysical categories of Being and Non-Being, Charleton writes: ‘The universe, or this adaptable world (henceforth synonomyes) doth, in the general, consist of only two parts, viz. something and nothing, or body and inanity’ (Physiologia, 16).

Roughly, body and inanity are the Epicuro-Gassendo-Charlotian counterparts of Parmenides’ metaphysical concepts of Being and Non-Being. Concerning divisibility and the simplest of bodies, Charleton says:

In relation to their corporeity, they are called bodies, by way of transcendency: because they are devoid of all incorporeity, i.e. they contain nothing of inanity, as do all concretions emergent from them, there being in all compound bodies more or less of inanity disseminate among their particles. For which reason, they [the bodies devoid of inanity] are also named plena. (Physiologia, 86)

The simplest sort of body is devoid of inanity. Such a body, he says, is a plenum. A plenum is not divisible because it contains no inanity; divisibility is meaningful only for bodies that are composites of plenum and inanity. This concept of divisibility is parasitic on, or understood in terms of, the concepts of body and inanity. Charleton seems to be suggesting:

Body A is divisible if and only if (i) A is composed of at least two bodies, B and C, and (ii) B and C are actually separated by inanity.

Inanity serves, at least conceptually, as the cleaving point or as the locus of division. Division is always decomposition of compounds

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15 See also Principles ii. 20.
consisting of atomic plena and inanity. This concept of division is not applicable to a plenum and that looks similar to Parmenides' point about the indivisibility of his plenum-like Being. But, instead of a single Parmenidean plenum, the Physiologia view is that there is an infinite number of plena that are, in fact, the atoms.

We noted that this sort of argument against the divisibility of the atom that we find in Charleton's work is similar to Parmenides' against the divisibility of Being. A Charletonian atom is a bounded plenum. This kind of indivisibility is a significant departure from Gassendi's own view in which atoms are only naturally indivisible. There is also an interesting connection between the way that Charleton's view in Physiologia guarantees the indivisibility of the atom and the way Spinoza guarantees the indivisibility of his plenum (i.e., res extensa), which is not, strictly speaking, an atom.

Charleton arrives at the meaninglessness of dividing the atom. A careful look at Spinoza's arguments will help us better understand a sense in which Descartes's res extensa (the plenum) is indivisible, and hence is substantial. Of course, if we want Descartes to be able to say that body is divisible by its very nature, we will finally need to specify another sense of 'divisible', a sense that is compatible with the other sense in which extension is indivisible.

3. DIVISIBILITY, SUBSTANCE, AND DISTINCTION

In his Ethics, Spinoza's first argument for the indivisibility of substance comes at the beginning. This argument's first premise appears in EIP4:

Two or more distinct things are distinguished from one another, either by a difference in the attributes of the substances or by a difference in their affections.

The second premise is introduced in EIP5:

In nature there cannot be two or more substances of the same nature or attribute.

The argument takes the form of a reductio. The supposition to be reduced to absurdity is that a corporeal substance A is divided into bodies B and C. It follows from this supposition that B and C must be understood either (1) as distinct substances with different attributes, or (2) as having the same attribute and being distinct only in terms of affections or modes. But because they are bodies, B and C do have the same attribute—namely, extension. Since two or more substances cannot have the same attribute, (2) rather than (1) must be the case. In other words, B and C cannot be distinct substances; they are distinguished only by their modes. They are distinct modes of a single substance.17

This means that, if A is divisible, the division must not be understood as division into distinct substances. The Charleton-like conclusion here is not that division is physically difficult; rather, the idea is that there is no way to conceive the division of a corporeal substance into two distinct corporeal substances. Accordingly, Spinoza concludes in EIP13C: 'From these propositions it follows that no substance, and consequently no corporeal substance, insofar as it is substance, is divisible.'

Another argument against the divisibility of corporeal substance is given in EIP15S:

For if corporeal substance could be so divided that its parts were really distinct, why, then, could one part not be annihilated, the rest remaining connected with one another as before? And why must they all be so fitted together that there is no vacuum? Truly, of things which are really distinct from one another, one can be, and remain in its condition, without the other. Since, therefore, there is no vacuum in nature (a subject I discuss elsewhere), but all its parts must so concur that there is no vacuum, it follows also that they cannot be really distinguished, i.e., that corporeal substance, insofar as it is substance, cannot be divided.

A simplified version of this argument is:

(3) The parts of res extensa (the plenum) are really distinct only if a vacuum is possible.
(4) A vacuum is impossible.
(5) So, the parts of res extensa (the plenum) are not really distinct.

The relevant notion of real distinction is borrowed from Descartes. Two things are said to be really distinct if and only if we can clearly

17 The question of division into modally distinguished bodies is taken up below. Our goal here is not, of course, a complete interpretation of EIP4-D.
and distinctly understand one ‘apart’ from the other. 10 Things that are really distinct are substances. How real distinction is connected to real division will be addressed shortly. For the moment, it is important to note that Spinoza takes ‘vacuun’ in Descartes’s ‘philosophical sense’—namely, as a term denoting an extended nothing. It is, like ‘atom’, a term that expresses a conceptual repugnancy or contradiction. Since nothing cannot have any properties, and extension is a property (an attribute in the technical sense), if there is an instance (or existent region) of extension, it is not an extended nothing. It is an extended something. And so, in line with Descartes, Spinoza holds (4) to be true because a vacuum is a conceptual impossibility.

In having drawn the conclusion (5) in this simplified version of the EIP15 argument, Spinoza makes sure to tell us that this conclusion is connected to the indivisibility of corporeal substance. As we saw, he established this claim earlier in the Ethics. For discussion’s sake, we will call the claim about the parts of res extensa not being really distinct from one another the Claim against Real Distinction and the claim about the indivisibility of corporeal substance the Claim against Divisibility. In light of his first argument against the divisibility of body, which established the Claim against Divisibility, one reading of the EIP15’s argument is to take Spinoza as advancing the following reductio. Dividing the plenum would require separating regions of extension off from one another, the separated regions being themselves independent substances. But this contradicts the conclusion of the first argument, which established the Claim against Divisibility by noting that the separated regions of extension would possess the same attribute—namely, extension—and thus would not be separate or distinct substances. In claiming that the parts of res extensa are not distinct substances, Spinoza is already in a position to make the Claim against Real Distinction. So, the Claim against Divisibility and the Claim against Real Distinction are conceptually related.

The EIP15’s argument reinforces the first argument against divisibility. It makes the connection between the notion of real distinction, indivisibility, and the impossibility of a vacuum. Setting up yet another reductio, Spinoza suggests that if (per impossibile) some regions of extension were annihilated such that remaining regions were separated without being otherwise changed in any way, then these remaining regions would exist independently from one another. The proviso ‘without being otherwise changed in any way’ is required for the ontological independence guaranteed by real distinction. The resulting real distinctions would demonstrate that the original regions were, in exactly this sense, divisible. The reductio is concluded by noting that, if the plenum were divisible in this way, then what is vacated by the annihilations would be vacuums. And that is conceptually impossible.

Suppose, to elaborate this example, that we marked off three regions of the plenum, A, B, and C, where A and C are not contiguous, because B stands between them. Now suppose that the middle region B could be annihilated. What would happen? Well, since nothing at all now stands between A and C, they would supposedly be contiguous. Their relative positions have thus been altered, thereby spoiling the attempt to show that they are independent from B, or from one another. In other words, a better attempt to conceive the ‘annihilation’ of B would be to conceive A and C being made contiguous not by B’s vanishing, but by their squeezing B so that it is dispersed to other locations.

There is an interesting line in a letter from Spinoza (Letter 4): ‘Men are not created, but only generated, and their bodies existed before, although formed in another way. From this something follows which I willingly accept, namely that if a single part of matter were annihilated the whole of extension would vanish with it’ (C. 172).

It is clear on our interpretation why Spinoza thinks that the per impossibile annihilation of a single part of matter entails the (also per impossibile) annihilation of the extended whole. Otherwise, there would be a vacuum and that is flatly impossible. One must be struck by the similarity between what Spinoza says here and what Parmenides says about Being: ‘it must either be completely or not at all’. But, it seems that the idea they express can be understood in terms of what we have said above. If the regions of res extensa were, per impossibile, really distinct from one another—again, think of regions A, B, and C—then an annihilation of B would not require any adjustments in other, independent bodies. But, if an annihilation of B is to bring it about that nothing exists between A and C, then it is simply a stipulation that A and C are contiguous. The point is indeed not the

10 AT viii. 28; CSM 1. 213.
one rejected by Bennett.\textsuperscript{29} That metaphysical rubber bands would pull A and C together. The supposition of the annihilation of B entails likewise the supposition that other bodies are affected. Either A and C are made contiguous, or other bodies replace B, or A and C are themselves annihilated. It follows that the regions of res extensa do not enjoy the independence required for real distinction; they are not distinct substances. Any plausible interpretation of Spinoza’s monism requires that ‘individual’ bodies are not themselves substances really distinct from one another, but are instead modes of the one corporeal substance. These arguments provide one way of maintaining that result.\textsuperscript{30}

Despite all this, Spinoza requires a sense in which individual bodies are divisible. Part II of \textit{Ethics}, for instance, depends crucially on the composite structure of bodies, and what is composite can be decomposed or corrupted. Spinoza’s bodies are not really distinct from one another in the technical sense, but are instead distinguished by their states of motion-and-rest, and by the component bodies that they unify.\textsuperscript{31} Spinoza, therefore, needs one sense of ‘divisible’ in which individual bodies are divisible, and a second sense in which extension is indivisible.

The first sense allows us to say that a body understood in terms of an abstract concept of quantity, which has its source in the imagination, is divisible. The second allows us to say that body understood in terms of its nature or essence, which has its source in God’s pure intellect, is indivisible. ‘If someone should now ask why we are, by nature, so inclined to divide quantity, I shall answer that we conceive quantity in two ways: abstractly, or superficially, as we commonly imagine it, or as a substance which is done by the intellect alone without the help of the imagination’ (EIP15§5).

The imagination ‘helps’ by providing perceptions of distinct modes that are all conceivable through the one substance. The passage continues: ‘matter is everywhere the same and [p]arts are distinguished in it only insofar as we conceive matter to be affected in different ways, so that its parts are distinguished modally, but not really’.

So the intellectually perceived essence, extension, is indivisible, but bodies that are perceived imagistically are perceived as divided and as separable from one another—separable not by vacuum, but by the intercession of other bodies.

One might still wonder how corporeal substance understood as the essence of body rules out the possibility of a vacuum in \textit{Nature}. How is it that the indivisibility of a divine essence or attribute, something not subject to the conditions of space and time, logically guarantees that a vacuum cannot be produced in the imaginable, physical world?

Since the essence is utterly indivisible, it cannot be somehow present as divided in imaged individual bodies. But the individuals must be conceived through the essence. So, insofar as extension, the essence, exists in the imaged bodies, it ‘must exist as a whole’ in each of the parts.\textsuperscript{32} It cannot turn out that some of the essence is in these parts here but not in those there. So, the nature or essence of body is wholly in any and every part or region of the plenum. In other words, since any region of the plenum will have the formal essence of body (extension), it follows that there cannot be a vacuum. It will be impossible for there to be an extended region of \textit{nothing}, since an extended region has the complete essence of body, which is corporeal substance. And, substance is not nothing.

Three things have emerged from Spinoza: (i) A vacuum is impossible because the plenum cannot be really divided, (ii) the plenum cannot be really divided because its parts are not really distinct from one another,

\textsuperscript{29} Jonathan Bennett, \textit{A Study of Spinoza’s Ethics} [Spinoza’s Ethics] (Indianapolis: Hackett, 1968), 99.

\textsuperscript{30} Bennett handles this with what he calls the ‘Field Metaphysic’—the idea that bodies are concentrations of ‘massiness’ in space. Individual bodies are then alterations in the massiness of underlying space. This space is not a container; vacua are possible in the Field Metaphysic because regions that sometimes have zero massiness are possible. Bennett argues that this is the view expressed in Spinoza’s text (Bennett, \textit{Spinoza’s Ethics}, 89–110; and \textit{Learning from Six Philosophers} (Oxford: Oxford University Press, 2001), i. 142–50). The Field Metaphysic has some interesting virtues, but it is not ultimately available to Spinoza. The crucial sticking point is that massless regions of extension are devoid of body, but for Spinoza and Descartes extension is the essence of body. Extension without body involves a contradiction—massless space would be extended nothing, so ‘massless space’ is as much a nonsense term as ‘vacuum’ is. Moreover, massiness turns out to be the essence of body—no mass, no body, and vice versa. Spinoza aside, it is quite uncontroversial that Descartes is not drawing a modal distinction between mass and space. Space is distinct only by reason from extension (\textit{Principles} ii. 10; AT viiia. 45; CSM i. 1227). What some might conceive as ‘quantity of matter per unit volume’ is nothing but quantity of extension for Descartes.

\textsuperscript{31} That from the ‘physical digestion’ between EIP13 and EIP14.

\textsuperscript{32} Here we follow Tad Schmaltz, who argues in detail for this point in ‘Spinoza on the Vacuum’, \textit{Archiv für Geschichte der Philosophie}, 81 (1999), 174–205.
and (iii) the parts are not really distinct from one another because we cannot clearly and distinctly perceive them appropriately separated from one another. As was noted above in Section 1, the indivisibility of Being for Parmenides, the indivisibility of the atom for Charleton, and the indivisibility of extended substance for Spinoza are structurally similar doctrines. They are similar at least regarding what they took to be at the bottom of the claim about indivisibility — namely, that indivisibility results from the inconceivability of division. We now proceed to evaluate the degree to which this insight can be found in Descartes.

4. DESCARTES ON REAL DISTINCTION, MODAL DISTINCTION, AND DIVISIBILITY

Descartes famously lays down three sorts of distinction: real; modal; and rational or ‘conceptual’.29 Although he relies on a version of the first in the Sixth Meditation to establish his claim that the mind and body are really distinct substances, we get explicit definitions of all these distinctions in Principles i. 60–2. We will briefly work through the relevance of each to the present concern. As we have already seen, concerning real distinction, he says at Principles i. 60: ‘Strictly speaking, a real distinction exists only between two or more substances; and we can perceive that two substances are really distinct from the fact that we can clearly and distinctly understand one apart from the other’ (AT viiia. 28; CSM i. 213).

The paradigm case is the real distinction between mind and body, or mental and corporeal substance. When we distinctly conceive a mind, we necessarily conceive it as being a non-extended thing that thinks. It is not that we are ignoring the idea of extension. Rather, the idea of a thinking thing excludes the idea of an extended thing and conversely.

Concerning modal distinction, Descartes says: ‘A modal distinction can be taken in two ways: firstly, as a distinction between a mode, properly so called, and the substance of which it is a mode; and secondly, as a distinction between two modes of the same substance’ (Principles i. 61; AT viiia. 29; CSM i. 213–14).

When we think of a shape assumed by some wax versus the wax itself (that is, the wax qua bearer of different shapes at different times), we make the first sort of modal distinction. When we think of a shape of the wax versus some motion of the wax, we make the second sort of modal distinction. Descartes also considers the distinction that obtains between modes of different substances. About this case, he says: ‘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 viiia. 30; CSM i. 214). More on this shortly.

And, lastly, concerning conceptual distinction, he says: ‘A conceptual distinction is a distinction between a substance and some attribute of that substance without which the substance is unintelligible; alternatively, it is a distinction between two such attributes of a single substance’ (Principles i. 62; AT viiia. 30; CSM i. 214).

We cannot distinctly think of extended substance while excluding extension, its principal attribute, from that thought. If we hold that there is a difference between the substance and its principal attribute, we make the first sort of conceptual distinction. Duration, for example, is also an attribute — though it is not a principal attribute. When we draw a distinction between the extension of body and its duration, we make the second sort of conceptual distinction. This is not a modal distinction, though it may first appear like one. The difference is that, where we can conceive of some wax, for example, excluding this or that shape (that is, modes), we cannot conceive of some wax excluding extension or excluding duration (that is, attributes).

Descartes here makes a further remark concerning corporeal or extended substance that is difficult to make clear, given the reading we are trying to develop in this chapter. He says: ‘And we can also be certain that, if it exists, each and every part of it, as delimited by us in our thought [a nobis cognitum definitum], is really distinct from the other parts of the same substance’ (Principles i. 60; AT viiia. 28; CSM i. 213).

Here, it might seem that Descartes holds, in contrast to what we want him to say, that the parts of a body — and perhaps parts of
extensa itself—are really distinct from one another. In other words, it might appear that Descartes holds that individual bodies and their parts are individual corporeal substances. We contend, nevertheless, that there is another attractive reading of this text. To clarify this interpretation of Descartes’s doctrine, we start by looking more carefully at what he means by the phrase ‘as delimited by us in our thought’. The first step is to explain what Descartes calls adequate and inadequate ideas of substance. This will require some preliminaries.

In the *Principles*, Descartes defines substance as that ‘which exists in such a way as to depend on no other thing for its existence’ (*Principles* i. 51; AT viiia. 24; CSM i. 210). According to Descartes, only God is a substance in this sense. The two finite things that he mentions, thinking and corporeal things, depend on God for their existence. They are not, therefore, separable from God in the strictest sense, and are not in that sense substances. But, because mind and body depend only on the concurrence of God for their existence, the term ‘substance’ is applicable even though it is not univocally applicable to creatures and God. In the relevant sense, minds are separable from body and vice versa; they ‘can exist apart’ from one another. Moreover, created substances do not depend on any of their particular modes, though the modes do depend on the created substances (*Principles* i. 61; AT viiia. 29; CSM i. 213–14).

‘A substance,’ Descartes says, ‘may indeed be known through any attribute at all; but each substance has one principal property which constitutes its nature and essence, and to which all its other properties are referred’ (*Principles* i. 53; AT viiia. 25; CSM i. 210). The ‘principal property’ is clearly what Descartes usually calls the ‘principal attribute’ (e.g., at *Principles* i. 53; AT viiia. 25; CSM i. 210–11). Mental substance is known through the attribute of thought (or thinking) and corporeal substance is known through the attribute of extension. A mode is a way of being attributed. For example, being shaped is a way (mode) of being extended (attribute). In a 1642 letter to Gibeuf he writes:

> For I see clearly that the idea of the shape in question is joined in this way to the idea of the corresponding extension and substance, since it is impossible to conceive a shape while denying that it has an extension, or to conceive an extension while denying that it is the extension of a substance. But the idea of a substance with extension and shape is a complete idea, because I can conceive it entirely on its own, and deny of it everything else of which I have an idea. (AT iii. 475; CSMK iii. 202)

There is, then, a conceptual or logical relation that holds between the idea of shape (a mode), the idea of extension (an attribute), and the idea of that which needs ‘only the concurrence of God in order to exist’ (a finite substance) (*Principles* i. 52; AT viiia. 25; CSM i. 210).

We can, of course, think of the shape of a thing without focusing on its being the mode of some thing, but we cannot completely and distinctly separate off or exclude the idea of shape from the ideas of extension or substance.23 Focusing on the idea of shape, while ignoring the entailed ideas of extension and substance, is what Descartes calls in the letter to Gibeuf the ‘process of abstraction’ (AT iii. 475; CSMK iii. 202). By mentally focusing on the shape of a thing without thinking of the thing (that is, the substance) whose shape it is, one produces what he calls an ‘inadequate idea’. This is certainly connected to a point that he will make in the *Principles*: if we attempted to consider them [modes] apart from the substances in which they inher, we would be regarding them as things which subsisted in their own right, and would thus be confusing the ideas of a mode and a substance’ (*Principles* i. 64; AT viiia. 31; CSM i. 216).

Here the ‘inadequate idea’ appears to be characterized as a ‘confused idea’. Although we can *abstractly* conceive shape or extension apart from the substance of which it is a mode or attribute by obscuring our perception of the substance, we cannot distinctly conceive shape or extension existing apart from or excluded from a substance.

Taking confusion to be the epistemological complement of distinctness, we could make the following claim: if an inadequate idea is the epistemological contrary of a complete idea, and an inadequate idea is a confused idea, then a complete idea will be a distinct idea. From here we could make the following argument: since all distinct ideas are clear (*Principles* i. 46; AT viiia. 22; CSM i. 208), it follows that a complete idea, and, in this case, the idea of a complete corporeal substance, will be a clear and distinct idea. For discussion’s sake, we will now take ‘complete idea’ and ‘adequate idea’ to be synonyms,

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23 See Lawrence Nolan, ‘Nominalism and Reductionism in Descartes’s Theory of Attributes,’ *Topoi*, 16 (1997), 39–49, for a discussion of the mental operations of abstraction and exclusion and further references.
and likewise for 'incomplete idea' and 'inadequate idea'. Thus a complete idea contrasts with an incomplete idea, an adequate idea contrasts with an inadequate idea, a complete idea contrasts with an inadequate idea, and so on.

In the letter to Gibieuf, partially quoted above, Descartes also writes:

In the same way we can say that the existence of atoms, or parts of matter which have extension and yet are indivisible, involves a contradiction, because it is impossible to have the idea of an extended thing without also having the idea of half of it, or a third of it, and so conceiving it as being divisible by two or three. From the simple fact that I consider the two halves of a part of matter, however small it may be, as two complete substances, whose ideas are not made inadequate by an abstraction of my intellect, I conclude with certainty that they are really divisible. (AT iii. 477; CSMK iii. 202–3)

Suppose that we think of body D as being divided into two parts: E, which is approximately spherical; and F, which is approximately cubical. That is, recalling Principles i. 60, we so 'delimit' these parts in our thought. Descartes says that, insofar as his ideas of E and F are not made inadequate by an abstraction of his intellect, he can consider them as 'two complete substances'. As we already know, he says in the above letter to Gibieuf (and also in Principles i. 52) that the very idea of shape cannot be distinctly perceived apart from the idea of extension, which in turn cannot be distinctly perceived apart from the idea of substance. We can make this point by saying that the distinct idea of a body entails the distinct idea of extended substance. Thus, when distinctly thinking of body E as a shaped, extended thing, we have a complete idea of E as a corporeal substance—or, as it is put in the portion of the letter cited earlier, we conceive E as a complete substance. Moreover, in our conceiving F in like manner (as a shaped, extended thing), we can be said to be thinking of it as a complete substance. If we use the terminology established above, both are complete or adequate ideas of corporeal substance.

The philosophical question raised in Principles i. 60 of whether the number of corporeal substances—one or many—must now be addressed (the textual questions then follow). For, if E and F can each be conceived as complete corporeal substances, it would seem to follow that, for the very reasons that mind and body (similarly conceived as complete substances) can be conceived apart from one another, so can E and F. And, if they can be properly conceived apart, then it would follow that there are at least two corporeal substances. If D can be divided into two substances, then D is really divisible. So, are E and F distinct corporeal substances? That is, are they really distinct?

In the Sixth Meditation, Descartes says:

First, I know that everything which I clearly and distinctly understand is capable of being created by God so as to correspond exactly with my understanding of it. Hence the fact that I can clearly and distinctly understand one thing apart from another is enough to make me certain that the two things are distinct, since they are capable of being separated, at least by God. (AT vii. 78; CSM i. 54)

As we have seen he also says this at Principles i. 60. Since he has a clear and distinct idea of himself as a thinking, non-extended substance (mind), and another clear and distinct idea of extended, non-thinking substance (body), he concludes in the Sixth Meditation: 'It is certain that I am really distinct from my body, and can exist without it' (AT vii. 78; CSM i. 54). This is traditionally known as his Real Distinction Argument, which is supposed to prove that mind and body can in some sense exist independently of one another.

One obvious difficulty with the argument is that nowhere does Descartes make it clear in the premises that the 'separability' of two things is connected to their being able to exist independently of one another. And yet the conclusion turns on just this connection. Recall that at Principles i. 60 he says:

Strictly speaking, a real distinction exists only between two or more substances; and we can perceive that two substances are really distinct simply from the fact that we can clearly and distinctly understand one apart from the other . . . For example, even though we may not yet know for certain that any extended or corporeal substance exists in reality, the mere fact that we have an idea of such a substance enables us to be certain that it is capable of existing. And we can also be certain that, if it 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 viiia. 28; CSM i. 213)

This passage does not specify whether the 'delimitation' itself must be clearly and distinctly executed. According to a conservative reading
of this passage, we get that E and F, insofar as each is understood to be a complete substance, are thereby understood to be really distinct from one another. Does it follow, then, that they can exist independently of one another? This is a crucial requirement for substances really distinct in the strongest sense.

Now, the essence of a thing is its principal attribute (Principles i. 53; AT vi. a. 25; CSM 1. 210). The principal attribute of E and F is extension, so the essence of E and F is to be extended. Next, suppose that, as a result of dividing D, from which E and F arise as parts, E has shape s₁ with size n₁ and F has shape s₂ with size n₂, where s₁ is not identical with s₂ and n₁ is not identical with n₂. Clearly, with respect to essence or principal attribute, E and F are identical. It is with respect to their shapes and sizes that they differ. In other words that recall Spinoza, we do not tell E and F apart by appealing to their attributes (for they have the same attribute, extension); rather we tell them apart by appealing to their modes of shape and size. So, in conceiving E and F apart from one another, we are relying on modes and using what Descartes calls a modal distinction. In focusing on the shapes (modes) of E and F in order to tell them apart while ignoring their essence, we are abstracting from the essences and thus produce inadequate (and therefore to some degree, obscured) ideas of E and F. But; then; what is Descartes saying in the quoted passage from the Gibeuf letter when he claims that; insofar as his ideas of E and F are not made inadequate by his intellect, E and F are understood as distinct substances?

According to the present interpretation, we must begin by recalling that: (i) D (and E and F) are divisible in the sense that other bodies can intercede to separate them; (ii) E and F can also be understood adequately as entailing extension as their shared essence; (iii) in light of (ii), the distinction between E and F is modal and not real—the sense in which they can be divided is not the sense of division that entails separation or possibly existing apart. But; (iv) the Gibeuf letter has it that E and F are substances; and (v) substances are distinguished really, not modally. That apparent inconsistency can be resolved if Descartes

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25 If an individual body is a mode of extension, then one might regard that body’s individual essence to be its delimitated quantity of extension and not extension simpliciter. This would, however, be an inadequate conception of the essence. This inadequacy is reflected by the fact that no individual (non-human) body’s determinate extension persists for more than an instant (letter to Mersland, 9 Feb. 1645; AT iv. 167; CSMK iii. 243).

has two senses of ‘substance’. In one sense, x and y are really distinct substances if they can be separated and exist apart. This corresponds to the strong sense of division in which the extended plenum is not divisible. In the other sense, x and y are modally distinct substances if they cannot exist apart and can be divided only by other things sharing their essence. Here we have the weak sense of division in which body is divisible by its very nature. In what follows, we hope to show that this handling of Descartes’s terminology in the Gibeuf letter is illuminating and not ad hoc.

The complete or adequate idea of E is the idea that makes its possessor understand that shape s₁, size n₁, and E’s other modes entail extension. Similarly, the complete or adequate idea of F is the idea that makes its possessor understand that shape s₂, size n₂, and F’s other modes entail extension. Were we to compare the two ideas, the only differences would be brought to light by our focusing on their respective shapes and sizes—that is, on their modes, not on their essence. In other words, they seem to be distinct substances only insofar as our idea of E as a corporeal substance excludes the modes of F. This fits the definition of modal distinction if we are properly thinking of E and F as having the same essence. But it also seems to fit the definition of real distinction if we consider F’s modes in abstraction from F’s essence, because we then understand E as existing apart from F. But that involves an abstracted, inadequate idea of F, just because the essence is omitted. Of course, the same holds if we reverse the positions of E and F in this exercise. The result is that a somewhat obscure and confused consideration (‘superficial’ and ‘imaginary’ in Spinoza’s terminology) leads one hasty to affirm a real distinction where, very strictly speaking, there is only modal distinction. To avoid this error, one must heed Descartes’s famous rule for truth: affirm only what is clearly and distinctly perceived.

This had better be very different from the mind–body case where we do get genuine real distinction. Here is why it is. Let us suppose that Descartes is a mind–body union and repeat this argument. Descartes’s mind has idea i₁, and his body has shape s₁, i₁ entails the attribute of thought and s₁ entails the attribute of extension. Now, since a substance has only one principal attribute and thought and extension are different attributes, it follows that there are two substances in play. In other words, we can conceive of the essence of Descartes’s mind
while excluding the essence of his body, and vice versa. They are indeed really distinct. Now consider again the case of E and F, the parts of the body D. Although we can think of E's modes while excluding F's, we cannot conceive of E's essence while excluding F's, for they have identically the same essence—namely, extension. In making a distinction between a mode of mind and a mode of body, Descartes says that, because their modes entail distinct principal attributes, we are ultimately making a real distinction. But, in making a distinction between a mode of E and a mode of F, we cannot go on to say, as we just did in the case of Descartes's mind and his body, that we are ultimately making a real distinction. This, again, is because their modes entail the same principal attribute. The distinction between E and F, therefore, remains a modal distinction. There does not seem to be a rigorous way to draw a real distinction between corporeal substances.

Recall that for Spinoza there are two ideas of body. The first involves inadequate abstractions while the second is the true intellectual conception. Our analysis connects Descartes's incomplete or inadequate idea of body with Spinoza's abstract, 'superficial', idea of body, and correspondingly connects Descartes's complete or adequate idea of body with Spinoza's true intellectual conception of body. The incomplete or inadequate idea, which focuses on modal differences, gives us a sense in which bodies can be divided—in the example used above, the finite body D can be understood as divided into bodies E and F. We understand the division in terms of a difference in sizes and shapes. By contrast, the complete or adequate idea, which focuses on the conceptual or logical entailment that holds between mode, attribute, and substance, gives us a sense in which body cannot be divided. We cannot distinctly conceive the division of D into separate, independent substances E and F, because, when conceiving E and F in terms of their essences (their principal attributes), there is no way to conceive E and F as being distinct (since they have the same principal attribute).

We are ready to consider the textual problems. For one, we are left with the recalcitrant line in Principles i. 60: 'and we can also be certain that, if it 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'. Since Descartes is here offering the parts of a body as exemplars of real distinction (and not, as the present interpretation would have it, as exemplars of modal distinction), the text is puzzling. We think the puzzle is best solved as follows. We again lay heavy stress on the phrase as delimited by us in our thought. How does this delimitation take place? It must be by the consideration of shapes, sizes, and motions—that is, by modes. We might regard or consider these modes as if they were substances. There is, after all, a way (an inadequate or confused way, to be sure) of regarding them as existing apart. One of these bodies might be corrupted by motions that result in its further division while the other persists undivided. That possibility is guaranteed by the sense of divisibility in which bodies can be divided. Of course this 'corruption' does not destroy the (shared) essence of the bodies. So we could say that there is a 'secondary' sense in which individual bodies can be regarded as really distinct and therefore a secondary sense in which they can be regarded as substances.38 At this point, we also have a rationale for Descartes's use of the secondary sense of 'substance' in the Gibeuf letter. This is not a conclusive resolution of the most difficult texts, but we think it is much more satisfying than supposing that Descartes really did unknowingly walk into an inconsistency.

According to atomism, an atom is an individual substance. Descartes's position is that, if E and F were genuine atoms, then there would be a way to conceive of them as distinct corporeal substances. But, E and F have identical essences. If, therefore, we manage to draw any distinction between them, it will be a modal distinction. We cannot conceive of them as being really distinct; unlike the very different mind-body case. Since the only idea we can employ that allows us to think of E and F as distinct are our inadequate or incomplete ideas of them, and such ideas give us one sense of 'divisible', we can say that D, from which E and F are taken, is divisible (and we can say the same for E and F and their parts, and so on). Descartes can consistently maintain that the plenum, res extensa, is divisible by its very essence, but the divisions or separations among the parts determine only modal distinctions. We have also isolated a remaining sense in which the

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38 This is following up on a suggestion of Gueroult's that has been developed by Alice Sowaal. Where we call finite, modal bodies 'secondary', they call them 'tertiary', because they start the count with God as 'primary' and extension and minds as 'secondary'. See Alice Sowaal, 'Cartesian Bodies', Canadian Journal of Philosophy, 34 (2004), 217–40, for references and arguments different from those employed here.
plenum is, nevertheless, indivisible. This is when it is understood in terms of a complete, adequate, clear, and distinct idea. Divisibility (and indivisibility) in this case is determined by way of a real distinction. The 'parts' of *res extensa* are not really distinct, and thus the plenum cannot be 'really' divided.

The contrasting concepts of division provided by this reading of Descartes have the result that the apparent internal inconsistency introduced at the beginning of the chapter is just that—*apparent*. Descartes's principles of corporeal substance can in this way be seen to be fully coherent with his denying the possibility of atoms and void.27

27 We received helpful comments when some of the ideas in this article were presented at the 2003 Southern California Philosophy Conference and to audiences at UC, Irvine; Virginia Tech; UC, Santa Barbara; and UNC, Chapel Hill. We also received advice from Thomas Lennox, Ted Schaalke, and an anonymous referee.

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A New Challenge to the Necessitarian Reading of Spinoza

CHRISTOPHER MARTIN

One of the more provocative implications of Spinoza's metaphysics is its alleged commitment to necessitarianism. Whatever the merits and demerits of this view may be, I shall argue that Spinoza is not so committed. Or rather, I should say, he is not committed to the more pernicious strand of necessitarianism—*strict* necessitarianism. There is no doubt that he was a determinist, and that he understood this as a debilitating limitation upon our sense of free will. He maintained, for instance, that 'men are deceived in that they think themselves free, an opinion which consists only in this, that they are conscious of their actions and ignorant of the causes by which they are determined' (*Ethics* 3.5:7).

There is also general agreement among commentators that the laws of nature, as Spinoza conceived them, could not have been otherwise. Granting these commitments, the question of Spinoza's commitment to necessitarianism becomes whether the series of events that actually unfolds is the only possible series. Is it possible for me to have worn a lavender rather than a maroon shirt today, or is my wearing a maroon shirt a matter of logical or metaphysical necessity? The immediate past preceding my choice of shirt acting in concert with the laws of nature may have made choosing the maroon shirt necessary, but could the series as a whole have been otherwise—is it possible for there to have been a world much like this one but in which a figure much like myself...