

Spinoza on Extension

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<www.philosophersimprint.org/015014/>

§1 Introduction¹

Spinoza indicates in the *Ethics* that there is at least one “extended thing (*res extensa*)”, which is God, or nature (e.g., EIIp2), and that there are bodies, which are “modes of Extension (*modi Extensionis*)” (e.g., EIIp7). This is very naturally taken to mean that there are things — substances, modes, or both — that are extended in three dimensions, or that take up space. In this paper, however, I argue that this is not what Spinoza means. When Spinoza discusses the attribute of extension, he does not mean dimensionality, and by “an extended thing” he does not mean to describe something that takes up space. Not only is the essence of the physical not mere extension in space, for Spinoza, but it is not part of the essence of something physical to be extended in space at all.

The argument proceeds in two parts. First, in §2, I argue that when Spinoza writes that God, corporeal substance, or nature is “an Extended thing”, he does not mean that this substance is extended in length, breadth and depth. In other words, substance is neither space nor something that takes up space. I argue for this by showing that Spinoza allows that substance can be characterized by a certain conception of quantity, contrasts that with another conception of quantity that cannot be attributed to substance, and associates three-dimensional extension with the second kind of quantity, and not the first.

I go on in §3 to make the more controversial case that finite bodies, or modes of the “extended” substance, are also not properly

1. I use the following abbreviations for Spinoza: E = *Ethics*, where p = proposition, d = demonstration, def = definitions, c = corollary, a = axiom, app = appendix, l = lemma; KV = *Short Treatise on God, Man, and His Well-Being*; TIE = *Treatise on the Emendation of the Intellect*; TTP = *Theologico-Political Treatise*; PPC = *Principles of Cartesian Philosophy*; CM = *Metaphysical Thoughts*. All references to translations of Spinoza’s works except the letters are to Curley’s translation (C). In references to the letters I have used Shirley’s translation (S). Latin references are given to Gebhardt’s edition (G). References to Descartes’ *Principles of Philosophy* are to Cottingham, Stoothoff and Murdoch (CSM or CSMK). I am very grateful to Geoff Gorham, Nicholas Gresens, Yitzhak Melamed, Baron Reed, Eric Schliesser, and Daniel Schneider for their invaluable comments, and to the engaged audiences at the 2013 meeting of the Pacific Division of the American Philosophical Association, the 2013 meeting of the Foundations of Physics conference at LMU Munich and the 2014 Attributes Workshop at Barnard College.

understood as possessing dimensionality, offering three kinds of evidence. First, Spinoza explains that our perception of finite physical things as volumes is a function of the imagination, and hence inadequate, and the imagination does not inform us about the properties of natural things “as they are in themselves”. Second, given the relationship that Spinoza posits between Extended substance and its modes, if Extended substance is not itself extended in space, neither are its modes. Finally, innovations that Spinoza makes in his own natural philosophy and philosophy of science and in his treatment of Descartes’ physics eliminate mention of three-dimensional extension, along with Descartes’ epistemological motivation for making it the primary attribute of body.

To make things clearer, from here on out, when I refer to the attribute of Extension, I will write ‘Extension’. When I refer to three-dimensional extension in space, I will write ‘extension’. In these terms, the thesis of this paper is that for Spinoza, ‘Extension’ does not mean the same thing as ‘extension’. When I intend to remain temporarily agnostic about the meaning, I’ll write ‘Extension’. Quotes from Spinoza reflect his own decision to capitalize the word or not. He usually capitalizes ‘Extension (*Extensio*)’, the attribute, and not ‘extended (*extensa*)’ the adjective. Spinoza is not even consistent in this (see, *e.g.*, both “*modus extensionis*” and “*modi Extensionis*” in EIIp7s), so I don’t think there is any significance to it.

§2 Extended substance, or, the physical world

Here is a brief outline of the argument of this section, which aims to show that Extended substance is not extended in three dimensions. First, *Ethics* Ip15s and related propositions show that substance is Extended but not divisible. This means either (a) that substance is extended in space, but that extension in space does not entail divisibility; or, (b) that Extended substance is not extended in space, and extension in space may entail divisibility. Spinoza makes a distinction in EIp15s between two ways of conceiving quantity. One, let us call it quantity₁, is identified by three relevant characteristics:

it is conceived “abstractly” and “superficially” by the imagination, it does not apply to substance, and it is divisible. The other, let us call it quantity₂, has four relevant characteristics: it is conceived through the intellect, it is conceived “insofar as it is a substance”, it is indivisible, and it is conceived correctly “seldom and with great difficulty”. By considering Spinoza’s “Letter on the Infinite” and two different sections of the *Cogitata Metaphysica*, I show that Spinoza associates extension in space with quantity₁ and not quantity₂. The features of quantity₁ cannot be attributed to substance. Therefore, Spinoza is arguing (b), and substance is not extended in space.

Spinoza argues in the *Ethics* that there is one substance. That substance is God, where God is defined as a substance with infinite attributes (EId6, G II 45/C 409). Spinoza also refers to God as “Nature”, so I’ll use ‘God’, ‘substance’, and ‘nature’ more or less interchangeably.² Spinoza defines ‘attribute’ as “what the intellect perceives of a substance, as constituting its essence” (EId4, G II 45/C 408). Of God’s infinite attributes, we are acquainted with exactly two: Extension and Thought (EIIa5, G II 86/C 448). The physical world is God, substance, or nature understood under the attribute of Extension, and the mental world is God, substance, or nature understood under the attribute of Thought. Finite things, which Descartes thought of as substances, are for Spinoza *modes* of God, or nature, and not themselves substances. In these terms, a finite body is a mode of substance understood under the attribute of Extension.

In the second part of the *Ethics*, Spinoza claims that “Extension is an attribute of God, or God is an extended thing [*res extensa*]” (EIIp2, G II 86/C 448). As ‘*extendere*’ is used from Aristotle’s Greek equivalent

2. An interesting question is whether the arguments in this paper would apply equally to a (hypothetical) non-infinite substance, that is, a substance that did not have infinite attributes, since many of the following arguments rely on the infinite nature of the one actual substance. I suspect that they would not. But although Spinoza entertains the possibility of a non-infinite substance in Part I of the *Ethics*, he ultimately takes the idea to be not only impossible (EIIp8, G II 49/C 412) but incoherent (EIIp8s2, G II 50/C 413). Substance, that is, is essentially infinite, so there can be no further questions about the features of a non-infinite substance.

‘επεκτείνεται’ up through Spinoza, for something to be extended simply means for it to be spread out or to have dimensions.³ So, considering this claim in isolation from the rest of Spinoza’s work, it is natural to think that Spinoza takes corporeal substance, or God, to be something with dimensionality. That might mean that it is something with *mere* dimensionality, as in Jonathan Bennett’s influential interpretation, on which substance, understood under the attribute of Extension, is identical with space, and modes of physical substance are spatiotemporal regions of qualitative variation.⁴ Or it might mean that substance is an extended *something*, be that something matter, impenetrability, force, power, or whatever. In either case, it suggests that substance has dimensionality. A common worry about such a claim, in Spinoza’s time, was that it seemed to attribute to God a slew of imperfections associated with matter, chief among them divisibility, inertia, and passivity.⁵

Spinoza addresses this concern in the scholium to Ip15 of the *Ethics*, which is a refutation of those who “entirely remove corporeal, or extended, substance itself from the divine nature”. However, Spinoza also writes, signaling his agreement, that

everyone who has to any extent contemplated the divine nature denies that God is corporeal. They prove this best from the fact that by body we understand any quantity, with length, breadth, and depth, limited by some certain

3. In most ancient, medieval, and early modern contexts, something is extended if it has any number of spatial dimensions and can also be said to be extended temporally. (Descartes sometimes identifies the essence of bodies as just “extension”, but likely means extension in length, breadth, and depth.)
4. Bennett 128.
5. See, e.g., Grant 164: “To identify imaginary, infinite space with God’s immensity and also to assign dimensionality to that space would have implied that God Himself was an actually extended, corporeal being. Although Benedict Spinoza, Isaac Newton, and others would do precisely this, such a move would have been completely unacceptable in medieval and early modern scholasticism.” Of course, I am arguing here that Spinoza does not belong with Newton on this list.

figure. Nothing more absurd than this can be said of God, namely, of a being absolutely infinite.

Now, Spinoza defines 'body (*corpus*)' in a way that entails that it is finite: it is "a mode that in a certain and determinate way expresses God's essence insofar as he is considered as an extended thing", where something "determinate" is limited or finite (EId1, G II 45/C 408).⁶ So it is possible that Spinoza only means to say here that unlike a body, God is not limited or finite. This does not seem to exhaust Spinoza's meaning, however, since he mentions two more features of body from which his opponents might prove that it is absurd to attribute corporeality to God: that body is "any quantity" and that it possesses "length, breadth, and depth". But because he does not specify whether all of these features or just some of them are inapplicable to God, this text alone, though suggestive, is not decisive.

In the rest of that scholium, Spinoza directly addresses the concern that claiming that God is a *res extensa* entails that God is divisible, because anything that is extended can be divided and can be acted upon.⁷ Spinoza responds that he has shown already, at Elp12, that "[n]o attribute of substance can be truly conceived from which it follows that substance can be divided", and at Elp13c that "no substance, and consequently no corporeal substance, insofar as it is a substance, is divisible". He hasn't shown yet that a corporeal substance exists — that happens at EIIp2, when he proves that Extension is an

6. Spinoza's use of 'corporeal' can be confusing. He denies that God has a body (*corpus*) but attributes corporeality to God qua Extended substance. Since a body is a mode that expresses God's attribute of Extension, I take him to be using 'corporeal' in the same way as 'Extended' in the contexts where he attributes it to God. The idea, as he goes on to show, is that whatever it is that makes bodies bodies and not other kinds of finite modes is something that has to be contained in God as an attribute; here, he calls it corporeality, while elsewhere, he calls it Extension.
7. Descartes claims this at *Principles* I 26–27, and Aristotle in the *Physics* III; Leibniz would use the same reasoning later (e.g., in the *Monadology*). But the indivisibility of God was a very common reason for rejecting the possibility that God is extended. See Grant 245–247.

attribute of God — so all Ip15s shows is that *if* substance is Extended, it isn't divisible.⁸ But even if the proof is a bit out of order, Spinoza demonstrates in the *Ethics* that there is an Extended substance that can be neither divided nor acted upon — when that attribute is “truly conceived” (EIIP12, G II 55/C 419). So the claim that the attribute of Extension entails divisibility must be mistaken. Substance is Extended, but not divisible.⁹

There are, broadly, two possible ways to understand the claim that substance is Extended but not divisible. One is to take Spinoza to be using ‘Extension’ to mean extension, and to accept that substance is spatially extended but not divisible. So Bennett, for example, reasons: “... Spinozistic space is a unity: it cannot be divided in the sense of having really distinct parts. ... No part of space can exist, or be understood, without relation to the space as a whole, and hence its parts cannot be really distinct from each other”.¹⁰ Bennett goes on to argue that we are at liberty to imagine regions in space, but that those regions are not properly understood as parts of space. Whether you agree with Bennett that Extended substance is space, or think that it is a spatially extended something, on this view, it both has dimensionality and is indivisible.

The second possible approach, for which I would like to argue, takes Spinoza to deny that something can have both dimensionality and indivisibility. So rather than claiming in this passage that substance is

8. Spinoza takes himself to have proven that “an extended thing and a thinking thing are either attributes of God, or (by A1) affections of God's attributes” (EIIP14c2, G II 56/C 420). But I can't see that he has shown anything more than that if there is an extended thing, it's an attribute of God or an affection of God's attributes, because he doesn't show that there are any extended things until EIIa4 (G II 46/C 410).

9. At the end of the scholium, Spinoza makes the curious hedge that anyway, even if substance were composed of parts, he does “not know why [divisibility] would be unworthy of the divine nature”, since there is no other substance by which God could be acted upon. But this doesn't show that Spinoza thinks that it is possible that substance is divisible. He has already shown at EIIP12 and EIIP13 (G II 55/C 420) with its corollary that it is not, for reasons other than that divisibility entails the possibility of being acted upon.

10. Bennett 129.

spatially extended but not divisible, Spinoza is denying that substance is spatially extended. Extension is an attribute of God, but that does not mean that the substance which has that attribute, when “truly conceived”, is itself spatially extended.

To see this requires carefully considering Spinoza’s account of the varieties of quantity (*quantitas*). Just after his comment in the scholium that it is absurd to attribute certain (actual or apparent) features of corporeality to God, Spinoza goes on to distinguish between two kinds of quantity. He writes:

we conceive quantity in two ways: abstractly, or superficially, as we [NS: commonly] imagine it, or as a substance, which is done by the intellect alone [NS: without the help of the imagination]. So if we attend to quantity as it is in the imagination, which we do often and more easily, it will be found to be finite, divisible, and composed of parts; but if we attend to it as it is in the intellect, and conceive it insofar as it is a substance, which happens [NS: seldom and with great difficulty], then (as we have already sufficiently demonstrated) it will be found to be infinite, unique and indivisible.

Here, Spinoza clearly aligns quantity conceived as divisible with, first, the imagination, and, second, abstraction from substance.¹¹ Let us call this kind of quantity “quantity₁”.¹² I believe that both of these entail that when we conceive quantity this way, we conceive it inadequately. I will show this in §3, and it will serve as a premise in that section’s argument that *modes* are not adequately conceived as spatially extended. But in this section, regardless of whether quantity₁

11. For further discussion of Spinozistic abstraction, see Schliesser 2011.

12. I’ll talk in this paper about “kinds” of quantity in place of “ways of conceiving” of quantity. But as I hope will become clear, the arguments apply equally well if we think of quantity₁ and quantity₂ as different ways of conceiving the same thing, rather than different kinds of things. I am grateful to John Carriero for suggesting greater clarity on this point.

can be conceived adequately or not, I wish only to show that Spinoza associates divisible quantity with abstraction from substance and with conception through the imagination. It is thereby to be contrasted with indivisible quantity, which is conceived through the intellect and “insofar as it is a substance”. Let us call this second kind of quantity “quantity₂”. The question, then, is: Does Spinoza associate one of these kinds of quantity with extension? And more specifically, is it possible that for something to be characterized by quantity₂ — the infinite, unique and indivisible one that Spinoza attributes to substance — is for it to be spatially extended?

Elp15s suggests, although it does not prove, that the answer is no. In the part of the scholium quoted on page 6, Spinoza writes that we cannot apprehend quantity₂ through the imagination *at all*. The mind imagines when it has ideas of images, which images are affections of the human body caused by external objects; such ideas “present external bodies as present to us” (ElIp17s, G II 106/C 465). In other words, for Spinoza, imagination (or “imaginative cognition”) includes our sense experience of bodies. ElIp15s indicates that quantity₂ is accessed only by the intellect and not by the imagination, and that that conceiving of quantity in the way that applies to substance can be done only “seldom and with great difficulty”. So, if something characterized by quantity₂ were something spatially extended, then we could have no sensory experience of the spatial extension of that thing, and any conception we do have of it would be with “great difficulty”. Is this a view that Spinoza holds?

Finding a sure answer to this question would require a detailed Spinozistic theory of sense perception and of the properties that are represented therein, and Spinoza does not (at least explicitly) offer such a theory. However, I do not think this is a position that Spinoza is likely to hold, for two reasons. First, there is a little evidence that Spinoza does take extension and related properties¹³ like shape to be

13. “Extension and related properties” includes a large variety of properties — size, shape, distance, the extension itself, the abstract idea of extension, and so on. There are lots of interesting questions to be asked about the extent to which

represented in sense experience, which comes as part of the *Ethics*' analysis of error. Spinoza writes that we "imagine" the sun "as about 200 feet away from us" (EIIp35s, G II 117/C 473) and continue to imagine it that way even when we later come to know its true distance. This suggests that at least some dimensional properties are directly represented in visual experience, for Spinoza.

Second, we might regard this as the default position: there are those who have at least come close to denying that any extension-related properties are represented in sense experience, but they have done so on the basis of careful and well-worked-out theories of sense perception.¹⁴ A full discussion of this issue would take us too far afield

these represented in sense experience (and about whether this representation is direct or indirect) which we don't have the space to discuss here.

14. I am grateful to an anonymous reviewer for encouraging more attention to this interesting and complex point, and suggesting Hume and Berkeley as offering arguments that extension is not (directly) represented in sense experience. Neither straightforwardly deny, I think, that any properties related to extension are so represented. Berkeley sometimes says that the only direct objects of sight are color and light ("Essay Towards a New Theory of Vision" 43, 103), but other times he treats visible figure and extension as direct objects of sight without which we cannot conceive color ("Essay Towards a New Theory of Vision" 43 and 49, PHK 10). Also, his view of geometrical extension seems to depend upon extension's being an object of sense perception (e.g. the claim that extension is not infinitely divisible because there are *minima visibile*) ("Essay Towards a New Theory of Vision" 54). Hume suggests that our idea of extension is a compound idea, made up of ideas of indivisible colored points, "disposed in a certain manner" (*A Treatise of Human Nature* 1.2.3). But even on Hume's view, these dots have "dispositions" which appear to be irreducibly spatial. Reid's position is yet more complex—although Reid might look like someone who denies that we can directly represent spatial properties in sense experience, since he makes a strict distinction between sensation, through which we experience colors and smells, for example, and perception, which includes perception of size and shape, he counts this latter perception as direct perception of those properties. These considerations illustrate to some extent that it would be quite radical for Spinoza to hold that no such properties are represented in sense experience—not to mention that Hume's and Berkeley's theories of perception are motivated by and grounded in commitments that Spinoza does not share. Perhaps most important among these is that both Berkeley and Hume allow that even if spatial properties are not represented directly in sense experience, they can be inferred from that experience. Spinoza's very strict distinction between imagination and intellect and between their

here, but let us take Descartes' discussion of the issue in the *Sixth Replies* as a model. There, Descartes argues that nothing more than the perception of color and light "should be referred to the sensory faculty, if we wish to distinguish it carefully from the intellect", and that the judgment that a stick has a certain size, shape, and distance is the result of a "rational calculation" that "depends solely on the intellect" (Sixth Replies, AT 438/CSM 295). But in the same passage, he admits that the basis of this calculation is the experience of "the extension of the colour and its boundaries". Descartes' suggestion that the senses have at least some kind of access to the extension of bodies, and his view that this is a very natural position to adopt, is confirmed in a number of other places; to take just one example, Rule 14 claims that "by 'extended being' everyone standardly means something imaginable ... there is nothing more easily perceived by our imagination" than extension (AT 441/CSM 58). There is no indication that Spinoza departs from this.

However, these considerations are not decisive. For clearer evidence that Spinoza associates quantity₁ and not quantity₂ with spatial extension, we may look at some related but more detailed comments in Spinoza's "Letter on the Infinite" to Lodewijk Meyer. The passage quoted above from Elp15s is almost exactly reproduced in the letter, in the interest of explaining "why we have such a strong natural tendency to divide extended Substance". But this time, Spinoza goes on to offer parallel analyses of the relationship between duration and time, continuous quantity and measure, and discrete quantity and number:

Further, from the fact that we are able to delimit Duration and Quantity as we please, conceiving Quantity in abstraction from Substance and separating the efflux of Duration from things eternal, there arise Time and Measure: Time to delimit Duration and Measure to

objects, the two kinds of quantity, suggests that this is not possible. These considerations raise more questions than answers, but I hope only to make the point here that the view that sense perception has no access to these properties is radical, rare, and usually taken to require careful defense.

delimit Quantity in such wise as enables us to imagine them easily, as far as possible. Again, from the fact that we separate the affections of Substance from Substance itself, and arrange them in classes so that we can easily imagine them as far as possible, there arises Number, whereby we delimit them. Hence it can clearly be seen that Measure, Time and Number are nothing other than modes of thinking, or rather, modes of imagining. It is therefore not surprising that all who have attempted to understand the workings of Nature by such concepts, and furthermore without really understanding these concepts, have tied themselves into such extraordinary knots that in the end they have been unable to extricate themselves except by breaking through everything and perpetrating the grossest absurdities.

Spinoza is standardly interpreted as claiming, in this passage, that time, measure, and number are generated by the imagination, but not the things that are timed, measured, or numbered.¹⁵ For example, a cube has a definite volume, but it is imagination that decides whether we describe that volume as one cubic foot or 28 liters; a stoplight glows red for a definite amount of time, but it is imagination that decides whether we describe that time as 30 seconds or 30,000 milliseconds. Time, measure, and number are arbitrary metrics that organize things for our imagination, which does not entail that substance cannot endure or be extended, or that Duration and Quantity (and classes of things) are themselves imaginary.

But this passage is more radical than that. Spinoza does not say that time and measure are generated by the imagination; he calls them

15. See, for example, Bennett 196–197, Manning. Surprisingly, while the critique of the applicability of mathematical concepts to nature has been recognized here, Spinoza is still widely taken to endorse mathematical physics. Schliesser (2014) argues that Spinoza critiques mathematical physics, but does not take his comments here to entail that space and time themselves, independently of any metrics applied, are themselves imaginary.

"aids of the imagination". This implies that what is being measured (or timed, or counted) is *itself* imaginary. But what is being measured or timed is quantity and duration: time enables us to delimit duration in order to imagine it easily, and measure enables us to delimit quantity in order to imagine it easily. Likewise, to arrange things into kinds involves abstracting affections of substance from substance, and to help us organize those classes, we apply number. It is not merely time, measure, and number that are imaginary, but the things that they are labeling or organizing: duration, quantity, and members of a kind.¹⁶

The quantity here that is being discussed is quantity considered "in abstraction from substance", which must be quantity.¹ The suspicion that this refers to length, breadth, and depth is confirmed when we consider that Spinoza explicitly identifies measure as what labels or organizes "continuous quantity (*quantitati continueæ*)" in the *Metaphysical Thoughts* (I.I, G I 234/C 300). "Continuous quantity" refers unambiguously to geometrical extension. So, the "Letter on the Infinite" confirms that Spinoza denies that continuous quantity, insofar as it is subjected to measure, is predicable of God.

A defender of the view that God is nonetheless extended might respond by arguing that Spinoza understands both kinds of quantity to have dimensionality. The "continuous quantity" that is discussed in these passages is quantity when it is regarded as divisible, measurable, and manipulable by the imagination. But — the thought goes — we can also regard it in another way, one which is appropriate to God. It still has dimensionality when regarded in that way, but it is not so measurable, divisible, or manipulable.

The view expressed here has something in common with the one that Samuel Clarke expresses in his familiar debate with Leibniz over the nature of space. Clarke argues that space "may in our imagination

16. This relates to Spinoza's (not-always-consistent) denial of universal essences. Time and extension, as far as they are situated in Spinoza's system, would seem to have little in common: Extension is an attribute, while time is not; that is to say that Extension is a way of conceiving of things while time-related concepts like duration arise, Spinoza says, from the motion of bodies. Despite this, Spinoza often treats space concepts and time concepts in tandem.

be conceived as composed of parts, yet those parts (improperly so called) ... [are] not partable without an express contradiction in terms". So "space consequently is in itself essentially one, and absolutely indivisible" (Clarke [1717] Reply 4, Section 11). Leibniz responds:

I objected that space cannot be in God because it has parts. Hereupon the Author seeks another subterfuge, by departing from the received sense of words, maintaining that space has no parts, because its parts are not separable, and cannot be removed from one another by discription. But 'tis sufficient that space has parts, whether those parts be separable or not (Leibniz [1989] Reply 5, Section 51).¹⁷

Leibniz takes this to show that God's immensity is not the immensity of extension. I take Spinoza to be foreshadowing Leibniz, against Clarke, in the claim that space has parts in virtue of its being extended, even if those parts cannot be actually removed from one another. Clarke is not the first person to argue that space is indivisible, but the view is uncommon prior to Henry More.¹⁸

Indeed, it is a common view from Aristotle through to Spinoza that for something to be extended is identical with, essentially involves, or entails its having *partem extra partem*: part(s) outside of part(s), or parts next to parts, or spatially contiguous parts. For example, Descartes writes to More that "I call extended only what is imaginable as having *partes extra partes*, each of determinate magnitude and figure" (5 February 1649, AT 270).¹⁹ In Chapter 35 of the *Guide for the Perplexed*,

17. Descartes makes a similar point to Mersenne: "... an indivisible thing cannot have any length or breadth or depth. If it had, we could divide it at least in our imagination, which would suffice to guarantee that it was not indivisible: for if we could divide it in imagination, an angel could divide it in reality." (AT 213/CSMK 155)

18. See Grant, 234: "Patrizi, Bruno, Campanella, Gassendi, More, Spinoza, Raphson, Newton, and others were as one in the assumption that space is indivisible." (I am challenging here the inclusion of Spinoza in that list.)

19. The 'imaginable' here might seem to suggest that there is a sense in which extension, when conceived through the intellect, is not divisible. But it does

Maimonides writes: "... as [a corporeal thing] has extension it is also divisible", and Pasnau writes that "there seems to have been general agreement, throughout our four centuries [1274–1761] over what extension is: it is to have *partem extra partem*" (54). That Spinoza sides with Descartes and Maimonides, and would have sided with Leibniz against Clarke, in understanding spatial extension to entail the kind of divisibility that imperils God's perfection, is confirmed in another parallel treatment of duration and extension, found in Part II of the *Cogitata Metaphysica*. This section deals with, among other things, God's attributes, among which are numbered eternity and infinity. Although this is an early text, and Spinoza will come to reject aspects of its account of the divine attributes in later work, in conjunction with the "Letter on the Infinite" I think we can take the relevant passages as representative of some of Spinoza's enduring commitments.

In "Of God's Eternity", Spinoza argues that

since duration is conceived as being greater or lesser, or as composed of parts, it follows clearly that no duration can be ascribed to God: for since his being is eternal, *i. e.*, in it there can be nothing which is before or after, we can never ascribe duration to him, without at the same time destroying the true concept which we have of God. *I. e.*, by attributing duration to him, we divide into parts what is infinite by its own nature and can never be conceived except as infinite [B: We divide his existence into parts, or conceive it as divisible, when we attempt to explain it by duration] (CM II I, G I 250/C 316).

What is crucial is that Spinoza does not say here that by attributing *time* to God, we divide him into parts; rather, merely by attributing *duration* to God, we are admitting the *possibility* of dividing God into temporal parts, which is enough to imperil God's eternity. If we take

not: see Descartes' comment to Mersenne, cited in note 17. What it does suggest is that extension is essentially imaginable, for Descartes.

seriously the analogy between time and duration on the one hand and measure and quantity on the other, it would imply that merely by attributing quantity to God, we admit the possibility of dividing God into spatial parts, which is impossible.

I have made the point using duration, because, just like in the “Letter on the Infinite”, the language is clearer and the point is more explicit in that case. But a few paragraphs later, in “Of God’s Immensity (*Immensitas*)”, Spinoza hints at a similar argument against attributing spatial properties to God:

Nevertheless, usually when authors deal with God’s Immensity, they seem to ascribe quantity to him. For from this attribute they wish to conclude that God must necessarily be present everywhere, as if they thought that if there were some place which God was not in, then his quantity would be limited. This is even clearer from the other argument they bring forward to show that God is infinite, or immense (for they confuse these two), and also that he is everywhere. If God, they say, is pure act, as indeed he is, he must be everywhere and infinite. For if he were not everywhere, either he would not be able to be wherever he wishes to be, or he would necessarily — note this — have to move. From this it is clear that they ascribe Immensity to God insofar as they regard him as having a certain quantity; for they seek to argue for God’s Immensity from the properties of extension, which is most absurd (CM II III, G I 254/C 319).

What is “God’s Immensity”? Spinoza does not discuss it anywhere outside of this Appendix. But Spinoza does not, by God’s *infinity*, understand unlimited size: here, God’s infinity is defined as God’s supreme perfection, while later, in the *Ethics*, God’s infinity is identified as God’s having infinite attributes. If Spinoza intends a parallel analysis of immensity here, his meaning is clear: it is a

mistake to attribute literal omnipresence to God, because to do so is to imply that God has a certain quantity, or has the properties of extension, which is “most absurd”. Spinoza goes on in this chapter to claim that to understand how God is actually in every place is “beyond man’s grasp”. But it is certainly not in virtue of God’s having the properties of extension. As we saw above, Spinoza will ultimately change his view from the one stated here, to allow that there is a certain kind of quantity — intelligible, infinite, indivisible, and rarely understood — that does characterize substance. But here, Spinoza is discussing only what we have called quantity₁.

To conclude this section, I’d like to address three objections.

First, the arguments above preclude that the essence of substance, understood under the attribute of Extension, is extension. That means that Spinoza rejects a central principle of Cartesian physics, and it also means that Bennett’s interpretation of Extended substance as space cannot be correct. But they also preclude that the essence of Extended substance is not *mere* extension, but is still an extended something, or extension plus something else. This latter is a very common view of Spinoza’s modification of Cartesian physics. What is proposed as this “something else” usually relates to motion: perhaps Spinoza thinks that the essence of Extended substance is extension plus motion, or extension plus some motive power or force. This is taken to be plausible in light of an epistolary comment that Spinoza makes to Tschirnhaus late in his life that “... from Extension, as conceived by Descartes, to wit, an inert mass, it is not only difficult, as you say, but quite impossible to demonstrate the existence of bodies” (Ep. 81, G IV 255/S 352). Instead of defining matter through extension, as Descartes does, he argues that matter “must necessarily be explicated through an attribute which expresses eternal and infinite essence” (Ep. 83, G IV 258/S 355).

A more sustained argument against the view that Spinoza means to include something like motion or motive force in particular when he refers to “Extension”, making it part of the essence of matter, is given in Peterman (2012). The most compelling argument against

this interpretation is that Spinoza states quite clearly that Extension is the essence of corporeal substance, presupposing nothing else, while motion presupposes Extension.²⁰ So motion (or motive force) is not co-fundamental with Extension. But let us consider whether the arguments above leave open the view that “Extension” for Spinoza is spatial extension, plus something else – some other kind of force or power, or something like solidity, or inertia. Perhaps it is the addition of this something else that makes corporeal substance, or substance conceived under the attribute of Extension, indivisible.

A full rebuttal of this objection would be very difficult here, because it would have to address all the ways that this “something else” might be proposed, in a more precise way, to be related to spatial extension. I cannot make much sense of the idea that the attribute of Extension (an essence of God) is just spatial extension plus something else, as if these two features of it, unrelated to one another, served as a kind of conjunctive essence. So the best sense I can make of this kind of view is that Extension would be a spatially extended something – a spread-out solidity or inertia or force of some kind. But what, exactly, does it mean for power or solidity or inertia to be extended – or for anything that is not mere extension to be extended, for that matter? This is a deep problem in the history of philosophy that resonates in questions about how the mind is related to the body and how God is related to space and matter. Either the thing is spread out (it is part of its nature to be spread out), or it is repeated, or is it present in every part of space. But on the first two views, the thing (power, inertia, etc.) is prior to its being spread out or repeated – in other words, prior to its being extended.²¹ The third view is hard to make sense of, given that Spinoza

20. This argument is also made by Toland against Spinoza; see *Letters to Serena*, Letter IV, §11. The relevance of Toland to this issue was kindly indicated to me by a reviewer.

21. Leibniz, reading Spinoza’s Extension as spatial extension, criticizes Spinoza on precisely these grounds. According to Leibniz, “... there must be a subject that is extended – that is to say, a substance that can properly be repeated or continued. For extension signifies nothing but a repetition or continuous multiplicity of the parts, and consequently it does not suffice to explain

does not seem to accept that there is space independent of matter. If the thing is prior to its being extended, then it sounds like that thing is the essence of matter, and not extension.

Perhaps there is another option — that whatever the extra thing is, it is part of its essence to be extended in space. As far as I can tell, in the scholastic and Cartesian precedent examples of which were quoted throughout this section, and in Spinoza's adaptation of it, for which I've tried to offer ample evidence, it is not just something whose essence is spatial extension alone that is divisible, but anything in whose nature it is to be extended in space. So if it is in the nature of motive power (for example) to be extended in space, that motive power is thereby divisible and inappropriate to substance.

So we seem to be faced with two families of this type of interpretation. Either extension is somehow essential to the extra thing, so that the power or force or solidity is *essentially* spread out, or it is not. If it is, then it falls to all the critiques outlined in this section. If it is not, then the thing itself is more fundamental, and therefore *that* thing is what Spinoza means by Extension — not spatial extension.

A second objection is that I have ignored Spinoza's distinction among distinctions, and in doing so, ignored the possibility that Spinoza's main concern in the passages above is just to argue that substance is not really divisible, that is, divisible into two substances. Although throughout most of EI_p15s and the "Letter on the Infinite", Spinoza appears to be concerned with divisibility and indivisibility

the very nature of the substance that is spread out or repeated, whose notion is prior to that of its repetition" (Leibniz 179). Applying this to Spinoza, he argues that "what Spinoza imagines to himself, that from any attribute whatsoever comes an infinite thing, from extension a certain thing infinite in extension, from thought a certain infinite intellect, arises from the unsteady imagination of certain heterogeneous divine attributes, like thought and extension, and innumerable others, perhaps. For, since it is only a repetition of perceivings, extension is not, in and of itself, really an attribute" (Leibniz 276). I believe that Spinoza himself has something like this view of *duration* in mind when he writes that "duration is an affection of existence, and not of the essence of things. But since God's existence is of his essence, we can attribute no duration to him" (CM I, G I 25/C 315).

without specification, in Elp15s, Spinoza writes that the fact that quantity₂ is infinite, unique, and indivisible will be

sufficiently plain to everyone who knows how to distinguish between the intellect and the imagination — particularly if it is also noted that matter is everywhere the same, and that parts are distinguished in it only insofar as we conceive matter to be affected in different ways, so that its parts are distinguished only modally, but not really (G II 60/C 424).

However, the argument of this section depended only on Spinoza's association between (whatever kind of) divisibility and quantity₁, showing that he concludes on the basis of God's simplicity (of whatever kind) that God cannot be characterized by quantity₁. This argument does not depend on the kind of divisibility in question; it leaves open the possibility that God is modally divisible, but not the possibility that God is extended. The question of whether God is modally divisible is interesting to the extent that it bears on the question of whether modes are extended, a question that will be addressed at length in the next section.

This response supposes that Spinoza takes the question of substance's modal divisibility to be reducible to questions about the divisibility of modes from one another. I think this is a reasonable supposition. In CM Chapter V (G I 258/C 323), "Of God's Simplicity", Spinoza argues that there are three kinds of distinctions among things: real, modal, and of reason. He continues:

From these three all composition arises. The first sort of composition is that which comes from two or more substances which have the same attribute ... The second comes from the union of different modes. The third, finally, does not occur, but is only conceived by the reason as if it occurred ... Whatever is not composed in these first two ways should be called simple.

Spinoza goes on to show that God is “a most simple being”, which, at this point in the development of Spinoza’s thought, means that God is not even modally divisible. Moreover, something which is modally divisible is something that “comes from the union of different modes”. Now in this early work Spinoza also believes that there are “no modes in God” — a position which obviously changes before he writes EI_p15s. But there is no reason to think that Spinoza’s conception of modal distinction and divisibility changes between here and the *Ethics*. Substance cannot be divided into two or more modes, because it is not composed of two or more modes. It also cannot be divided into a mode and a substance. Complex modes are modally divisible, but we cannot make sense of the idea that substance is modally divisible.

Third, I’d like to address what I think is the most difficult passage for the argument I am making here. As part of the analysis of quantity in EI_p15s, Spinoza compares those who think that corporeal substance is divisible to others, who

... after they feign that a line is composed of points, know how to invent many arguments, by which they show that a line cannot be divided to infinity. And indeed it is no less absurd to assert that corporeal substance is composed of bodies, or parts, than that a body is composed of surfaces, the surfaces of lines, and the lines, finally, of points (G II 59/C 423).

Here, Spinoza equates the absurdity of thinking that lines are composed of points with the absurdity of thinking that corporeal (or Extended) substance is composed of bodies. This suggests that Spinoza sees corporeal substance, bodies, surfaces, lines, and points, and the relationships among them, as of the same class in some respect. It does not sound like Spinoza is distinguishing between geometrical objects like points and lines (which are *entia rationis*), on the one hand, and Extended substance (which is an *ens reale*), on the other. If the wrongness of thinking that substance is composed of bodies is

comparable to the wrongness of thinking that surfaces are composed of lines, perhaps it is reasonable to think that corporeal substance, like surfaces and lines, has spatial dimensions.

This passage may seem to suggest that corporeal substance is to bodies as a surface is to lines: both are really extended in their respective dimensions, and we may imagine parts in them, but they are not really divisible into those parts or composed of those parts. But if we extend the analogy, then the view that is deemed absurd here is that corporeal substance, being made up of three-dimensional bodies, is four-dimensional! (That may sound all right to our ears, but that is surely not what Spinoza intends.) This is obscured by the fact that Spinoza is concerned in this scholium with several different issues. One is the divisibility of substance, bodies, and lines in general, earlier in the passage. But here Spinoza is stressing the particular absurdity of claiming that lines are composed of points, etc. The absurdity of asserting that lines are made up of points arises from the fact that points are zero-dimensional and lines are one-dimensional, so if a line is composed of points, it is composed of nothings. What is absurd here is not the idea that we can divide extensions of various dimensions into parts, but rather the attempt to compose a whole out of the wrong kind of thing entirely.

To conclude: the quantity that Spinoza denies can be attributed to substance is three-dimensional extension. Either spatial extension is related to God in a way that does not entail that God, nature (*natura naturans*), or substance is itself spatially extended, or Spinoza means something other than spatial extension by 'Extension', or both. All this explains a comment Spinoza makes late in his life to Henry Oldenburg, the then-secretary of the Royal Society, responding to Oldenburg's concern that "reasonable and intelligent Christians" who read Spinoza's *Tractatus Theologico-Politicus* might be misled into thinking that Spinoza has "confused" God with nature. Spinoza replies that anyone who believes that the *Treatise's* conclusions "rest on the identification of God with Nature (by the latter of which they understand a kind of mass or corporeal matter)" are "quite mistaken"

(Ep. 73 to Oldenburg, G IV 306/S 332). Although God is an Extended thing, God is not “a kind of mass or corporeal matter”.

§3 Extended modes, or, finite bodies

The previous section argued that Extended substance is not itself extended in space, but left open the possibility that bodies, or finite modes of Extended substance, are. This section argues that we do not conceive of bodies adequately when we conceive of them as extended in space. First, in section §3a, I'll discuss the metaphysical gap that requires bridging if we accept that Extended substance is not extended, but continue to maintain that modes of Extension are. I'll argue that none of the proposed ways of bridging that gap are satisfactory, taking three such attempts as representative. Then, in section §3b, I'll offer some textual evidence that suggests that Spinoza did not take modes to be adequately understood as extended in space. Finally, in section §3c, I'll argue that given Spinoza's epistemology of science, we have no justification for believing that bodies are volumes. On the one hand, we appreciate their spatial properties through the imagination, which is unreliable. On the other, Descartes' primary motivation for reducing bodies to geometrical extension — that physics is tractable for mathematics — is, Spinoza thinks, misguided.

§3a

Perhaps, according to Spinoza, substance is not extended but modes are, since all of the considerations in §2 preclude the application of spatial extension to substance specifically. If this is true, we'd like to know how these spatially-extended modes follow from God's essence as described in *Ep*16, how their relationship to the attribute of Extension relates to substance's relation to that attribute, and, ultimately, how this relationship is supposed to illuminate the nature, behavior, and interactions of bodies in the physical world. There have been about as many accounts of the relationship between substance and its modes as there have been readers of Spinoza, and I cannot do justice to all of them here. I also do not want to take my own stand on

precisely what the relationship between substance and its modes is. I would just like to show that whatever that relationship is, there are reasons to think that modes are not fundamentally extended in space.

Here, I'll discuss three different influential classes of attempts to explain this substance-mode relationship while still maintaining that modes are extended in space. First, Curley (1969) argues that in calling bodies modes of extended substance, Spinoza is only committing himself to the claim that bodies are causally dependent on God. Second, Schmaltz (1999), who argues that corporeal substance is not extended in space, suggests that corporeal substance contains spatial extension eminently, explaining why the finite modes that follow therefrom are themselves extended, while substance is not. Finally, drawing on recent work by Yitzhak Melamed, I consider the possibility that Spinoza's infinite modes can bridge the gap between Extended substance and its modes such that modes are extended in space even though substance is not.

In his influential interpretation of Spinoza's metaphysics in Curley (1969), Curley argues that readers of Spinoza from Bayle to today systematically misread Spinoza when they understand modes as properties of substance or as inherent in substance. Instead, modes are just dependent on God because they are efficiently caused by God, and talk of modes being "in" God just indicates that Spinoza takes modes to causally depend on substance; otherwise, bodies would be the "wrong logical type" in Spinoza's system. Curley's account does not explain exactly how extended modes follow from non-extended substance other than as effects of an efficient cause, but if we reduce Spinoza's account of the substance-mode relationship to this, the question of the gap appears less pressing. At least, it does not arise any more than it would arise for someone who claims that God is a mind who creates bodies: there is no obvious reason why the cause and the effect should be understood as being modified by the attribute of Extension in the same way, or even that they should be modified by the same attribute at all.

This interpretation has been resisted by compelling arguments from a number of scholars, and so I will not address it at length here.²² Remaining as uncommitted as possible to exactly what the relationship between substance and modes is for Spinoza, it nonetheless seems clear that Spinoza's claim is that modes inhere in substance as effects of an immanent cause. The main reason that Curley gives for reading modes this way—that they are of the wrong logical type—is not compelling. Given Spinoza's Jewish and Neoplatonic influences, it is not at all surprising that he takes creatures to inhere in God. As for whether modes can be “predicated” of God, even Newton would, several decades later, argue that the relationship between creatures and God is more like the relationship between an accident and a created substance than like a relationship between two substances (Newton 89). There is quite a lot of evidence in the *Ethics* that Spinoza took modes to inhere in substance, including comments that they “move in God” and that “everything is in God”. For a more thorough refutation of the view that for Spinoza, modes do not inhere in substance, see, for example, Melamed (2009).

The reason for considering Curley's view, however briefly, is that it is a representative of an approach to addressing the challenge of respecting Spinoza's identification of God with nature while at the same time making sense of what he takes the world of finite physical things. It can seem that we are faced with a trilemma: should we (1) emphasize the identification of God and nature, and “naturalize” God; (2) emphasize the identification of God and nature, and “deify” nature; (3) de-emphasize the identification of God and nature, retaining intuitively appealing conceptions of both but losing, in a different way than (2), some of Spinoza's naturalistic resonances? Curley, in taking the third path, provides an appealing account of Spinoza's physics and philosophy of science, yielding a deductive-nomological, materialist, “sensible” Spinoza. But it is at the cost of doing some violence to the more fundamental metaphysics as well as to Spinoza's naturalistic God,

22. See, for example, Bennett 93 and Melamed (2009) 117.

who starts to look, on this account, like one who transcends nature. Bennett, on whose view corporeal substance, or God, is just space, takes route (1). Besides the textual evidence against this interpretation that has already been outlined, this view has Spinoza making the deeply radical identification of God with nature, but draws from that almost no implications for what the physical world is actually like.

Next, I'll consider another interpretation that follows route (3).²³ In "Spinoza on the Vacuum", Schmaltz draws on many of the passages cited in §2 to show that Bennett's "field-metaphysical" account of corporeal substance is not tenable. Assuming "Spinoza's endorsement of Descartes' claim that the parts of matter are divisible into further parts without end" (175), Schmaltz writes that "what we still need from Spinoza in light of his remarks in the "Letter on the Infinite" is an account of the manner in which the conception of quantity and duration as infinitely divisible depends on a conception of them as modes of an eternal substance" (196). Although we cannot attribute the properties of bodies that entail their divisibility (including extension) to corporeal substance, we can say that bodies have those properties in virtue of the fact that "there is some attribute in God which contains all the perceptions of matter in a more excellent way and can take the place of matter".²⁴ Corporeal substance must have the attribute of extension in order to explain the extension of bodies, but it does not have to relate to extension as a subject to a predicate — or, it does not have to be itself extended. Rather, we can see corporeal substance as an indivisible essence, not an indivisible subject that instantiates that essence (188).²⁵ In other words, "the extension of individual bodies is contained in God eminently rather than formally" (188).

There is a strong textual reason to be suspicious of this interpretation of the relationship between God and Extension. Schmaltz relies on

23. For a more extended discussion of Spinoza and naturalism, see Douglas.

24. CM I 2, G I 56/C 304.

25. See also Gueroult (1997) and Hallett (1957) for similar views. Schmaltz also relates his view to an account of the infinite modes in Schmaltz (1999).

a passage from the *Cogitata Metaphysica* II (G I 237/C 303), where Spinoza claims

that God contains eminently what is found formally in created things, *i.e.*, that God has attributes in which all created things are contained in a more eminent way ... *E.g.*, we conceive extension clearly without any existence, and therefore, since it has, of itself, no power to exist, we have demonstrated that it was created by God (Ip21). And since there must be at least as much perfection in the cause as there is in the effect, it follows that all the perfections of extension are in God. But because we saw afterward that an extended thing, by its very nature, is divisible, *i.e.*, contains an imperfection, we could not attribute extension to God (Ip16). So we were constrained to allow that there is some attribute in God which contains all the perfections of matter in a more excellent way (Ip9s) and can take the place of matter.

However, it is clear that Spinoza's views about the relationship between God and God's attributes changes dramatically from the *Cogitata Metaphysica* — an early and very Cartesian text, appended to Spinoza's commentary on Descartes' *Principles*. This isn't reason to ignore it, but in this case, Spinoza explicitly denies that substance contains extension eminently in the *Short Treatise*: "this effect of body through which we perceive it can come from nothing other than extension itself, and not from anything else that (as some maintain) has that extension eminently. For as we have already shown in the first Chapter, this does not exist" (KV XIX, G I 90/C 130). And there is no further mention of eminent containment of the Extension of bodies in God in the remainder of Spinoza's writings.

There are further considerations against this account that weigh against a wider class of interpretations: namely, any interpretation on which "Extended" has its usual meaning, bodies are extended, and God

is not.²⁶ When Spinoza proves at EIIp2 that Extension is an attribute of God, he does not leave it at that; instead, he writes pointedly: "Extension is an attribute of God, or [*sive*] God is an extended thing" (G II 86/C 449). What's more, Spinoza uses the phrase '*res extensa*' only to refer to God or substance, never calling a body a "*res extensa*", though he does not hesitate to call them "*res*" in other contexts. Similarly, he'll talk about "*substantia extensa*" but never a "*modus extensus*" — we find only "*modi Extensionis*". On Schmaltz's view, where God possesses the eternal and indivisible essence of extension while bodies are themselves extended, with all the imperfections that implies, we would not expect Spinoza to call God a *res extensa* and never describe bodies as extended.²⁷ What this suggests is that Spinoza intends to preserve as the primary and fundamental sense of 'Extended' the adjectival one, applying that to God. This is confirmed by the fact, discussed earlier in this section, that Spinoza identifies adjectives like "learned" and "big" as attributes of a man in the Hebrew Grammar (S 600).

Finally, one of Spinoza's motivations for admitting, in the *Ethics*, that God is Extended is to solve the problem of how a God who has

26. In a recent article, Fraenkel argues for a reading of Spinozistic Extended substance that draws on Aristotle and Crescas. On this account, for Spinoza, "the physical realm is transformed into God's infinite extension that 'produces, individuates, and determines' extended modes within itself. ... Infinite extension takes over the role of the form, *i. e.*, the role of producing, determining, and individuating the objects of the physical world" (92). While there are certainly links between Spinoza and Crescas, the textual evidence offered strikes me as too thin to support this particular Crescas-inspired reading of Extended substance. I am unsure whether Fraenkel would agree that Extended substance has actual dimensionality, or whether it is just the activity that informs infinite extension. If the former, then it is vulnerable to textual evidence from §2. If the latter, then it is vulnerable to arguments that resemble those given against Schmaltz's "eminent containment" interpretation here.
27. Compare this textual evidence also, for example, to Woolhouse's view that substance "underwrites the possibility of actual instantiations of extension, of actual extended things" (p. 47, my italics); or Fraenkel's view that Spinoza "integrate[s] the attribute of extension into the 'active essence' of God's infinite being ... God is ... 'extending' activity, which produces extended objects within itself" (87). Contrary to the implications of these readings, Spinoza seems to be at pains to stress that God is the Extended thing, properly speaking.

nothing of Extension can engender Extended creatures. Spinoza rejects the conception of God as creator *ex nihilo*, instead arguing that modes should be understood as God's *propria*, which flow from his essence and express it (EIp16, G II 60/C 425). In the scholium to Ip15, Spinoza writes approvingly of those who deny that God is a body like finite bodies, but argues that they go too far when

...they entirely remove corporeal, or extended, substance itself from the divine nature. And they maintain that it has been created by God. But by what divine power could it be created? They are completely ignorant of that.

After all, according to Spinoza, "if things have nothing in common with one another, one of them cannot be the cause of the other (EIp3, G II 47/C 410)". This passage raises two hard questions. First, what kind of relationship does Spinoza envision which avoids, on the one hand, "entirely remov[ing]" the corporeal from God's nature and, on the other hand, attributing to God the imperfections of modes of Extension? Spinoza's opponents, for example, would admit that God has an idea of Extension — why does that fail to explain how God can create matter, while eminent containment succeeds? Second, why doesn't a version of this argument apply to, say, ferrets: why isn't ferret-ness an attribute of God, since there are ferrets, and after all, how could God have created them without such an attribute? In other words, what is special about Extension, and why is Spinoza particularly concerned to show that Extension has the kind of fundamentality that requires that it be contained in God as an attribute?

I don't have detailed answers to all of these questions, which would depend in any case on upon the particular version of the family of interpretations that I am addressing here. But I see Spinoza's comments in the scholium as motivated by a consideration similar to the one that motivates Spinoza to respond, when asked what he believes are the sources of the errors of Descartes and Bacon, that they have "gone too

far astray from knowledge of the first cause and origin of all things”.²⁸ Insofar as we can do physics, corporeal substance must be considered as part of the subject matter. Spinoza, in calling God “an Extended thing”, is after a certain explanatory and ontological parsimony. Bennett, for example, retains this parsimony, but only by ignoring the divine properties of corporeal substance. While Schmaltz’s account respects those properties, it jeopardizes this parsimony and strips Spinoza of some important naturalistic resonances.²⁹

A third interpretation of Spinoza has it that the infinite modes can explain how we get from corporeal substance, which is not extended in space, to modes that are extended in space. It has been widely accepted that Spinoza intends the infinite modes to transition from an indivisible and eternal *natura naturans* to divisible and sempiternal *natura naturata*, although, of course, the details of the way this works vary from interpreter to interpreter. As a most careful and well-argued example of this kind of view, I’ll consider Yitzhak Melamed’s recent account of the infinite modes in Melamed (2013). The infinite modes are introduced in EIp21–23 as modes which “exist necessarily and are infinite” and “(a) follow either from the absolute nature of some attribute of God, or (b) from some attribute, modified by a modification which exists necessarily and is infinite” (EIp21–23, G II 64/C 429–430). (a) are usually referred to as the “immediate infinite modes”, and (b) as the “mediate infinite modes”. Melamed argues that a careful reading of Letter 12 shows that modes are divisible by their

28. Ep. 2 to Oldenburg, see also Ep. 31 (G IV 168/S 61).

29. Bayle articulates this thought nicely in his *Dictionnaire* entry on Spinoza: “I am not ignorant, that an apologist of Spinoza maintains that this Philosopher does not ascribe a material extension to God, but only an intelligible extension, and such as falls not under our imagination. But if the extension of the bodies we see and imagine, is not the extension of God, whence comes it? How has it been made? If it has been produced out of nothing, Spinoza is an orthodox man, his new system signifies nothing. If it has been produced out of the intelligible extension of God, it is still a true creation; for the intelligible extension being but an idea, and not having really the three dimensions, cannot form the matter of the extension, which formally exists out of the understanding.”

nature and substance is not, and that the infinite modes effect the transition from indivisibility to divisibility. If the infinite modes effect this transition, can they also effect the transition from the attribute of Extension as it is contained in or modifies God, and the sempiternal world of extended bodies?

This view can really be adequately addressed only after the arguments of the rest of §3 show independently the conclusion that modes are not adequately conceived as extended, but I would like to note one important problem with this account in particular. Spinoza identifies the immediate infinite mode of Extension: it is “motion in matter” or sometimes, “motion and rest”.³⁰ Whatever “motion” signifies for Spinoza, it seems to be what he thinks is responsible for variety.³¹ But Spinoza makes very clear that motion presupposes Extension; or, in the words of the *Short Treatise*, that Extension is conceived through itself but motion is conceived only through Extension.³² The infinite mode of motion and rest, then, already assumes an Extended thing, and that thing is Extended substance. In fact Spinoza does not say merely that every Extended thing is in motion, but that the entirety of physical nature is the only proper subject of the mode, motion, and rest.³³ In short, that there is motion presupposes that Extended nature exists, whatever it is — it does not help constitute it.

§3b

In this section, I’ll argue that a more appealing interpretation of Spinoza involves simply admitting that Spinoza does not think that modes are extended in space. I will argue that Spinoza does not think that modes are adequately conceived when they are conceived abstractly, superficially, and through the imagination, and that if this is true, they are not adequately conceived as extended in space.

30. See Elp21 and Ip22 (G II 64/C 426) and Ep. 64 to Schuller (G IV 278/S 298).

31. See, for example, KV II 14, G I 120/C 155.

32. Again, Toland makes this point in *Letters To Serena*, Letter IV, §11.

33. KV II, G I 45/C 48.

Section 2 showed that spatial extension should be identified with quantity₁, which Spinoza also associates with divisibility, duration, and conception through the imagination. It showed, further, that Spinoza denies that this kind of quantity (or this way of conceiving quantity) can be attributed to substance, primarily on the basis that this kind of quantity entails divisibility (although there is also independent textual evidence that Spinoza dissociates quantity₁ from substance). Sometimes it sounds like Spinoza thinks that modes are divisible where substance is not. For example, in this passage from the “Letter on the Infinite”:

When we have regard only to the essence of modes and not to Nature’s order, as is most often the case, we can arbitrarily delimit the existence and duration of modes without hurting our conception of them, and conceive it as greater or less, or divisible into parts.

Such passages seem to associate modes with duration and divisibility, contrasting them with substance, which is only rightly conceived as eternal and indivisible. Melamed (2013), for example, claims on the basis of such passages that “division pertains to modes, not to substance” and that “modes and only modes are divisible” (143).

It might seem natural to conclude that if modes, unlike substance, are divisible, they are also extended in space. After all, wasn’t the whole problem with attributing quantity₁ or spatial extension to God that extension is divisible and God isn’t? If we establish that modes are divisible, what reason have we left to deny that they are extended in space? If that’s right, then modes may be properly conceived as having quantity₁ even while substance is properly conceived only through quantity₂.

In the remainder of this section, I will show that modes are not properly conceived as having quantity₂. Before that, however, I would like to note that even if modes are divisible, they need not have that divisibility in virtue of their being extended in space – in other

words, although all extended things are divisible for Spinoza, it is not obviously the case that all divisible things are extended. According to Spinoza, a composite body (or composite thing of any kind) is one whose parts maintain certain causal relationships with one another (EIIp13def, G II 99/C 460) or, one whose parts are other individuals that “so concur in one action that together they are all the cause of one effect” (EIIId7, G II 85/C 447).³⁴ There is no mention here of spatial extension. This should not be surprising, since Spinoza thinks that we can speak of composite ideas, as well, and that their principles of composition should mirror those of bodies.

Spinoza *does* say that the relationship that must be maintained among the parts of a composite mode of Extension, or a body, is a relationship of “motion and rest” (*ratio motus et quietis*), and he is clear that modes of Extension are all in motion or at rest. We might think that this presupposes their being extended in space. First, however: it is possible that these modes are in space in some sense, but are not extended. It is an interesting question, and one that is of course very closely related to the one being asked here, what the relationship is between modes of Extension to space or spatial properties, be those properties real or mere appearances. But it is beyond the scope of this paper. Second, there is no reason to think that Spinoza means, by ‘motion’, local motion. In his reconstruction of Cartesian physics, Spinoza offers Descartes’ definition of ‘true motion’ as Definition 8 of Part II of the PPC (G I 181/C 263), but labels it instead as ‘local motion’ — an attempt, seemingly, to remain agnostic as to the definition of true motion or motion *simpliciter*. In

34. Spinoza characterizes the former as one “individual” and the latter as one “singular thing,” raising a number of more fine-grained questions about his account of individuation and identity. Does Spinoza mean the same thing by these terms? If not, how do they differ? If so, is one a more fundamental characterization of an individual than another? I don’t think that these questions bear on the arguments here; in any case, a full account of Spinoza on physical composition is too complex to fully explore here. For recent treatments relevant to this issue, see Peterman (2012), Shein (2012), and Schliesser (2014).

fact, Spinoza never defines motion, as his contemporaries and near-contemporaries³⁵ noted. We know only that motion is an immediate infinite of extension, that it is a property shared in common by all bodies and that (and this is somewhat more contentious) it is that property in virtue of which bodies interact with one another, or are the causes of effects (EIIp43).

The use of 'motion' to refer to the causes of motion in matter is not particularly idiosyncratic. Descartes identifies motion "according to the commonly accepted sense" as "the action by which some body is transferred from one place to another", distinguishing it from the transfer (Pr II 24–25). In his confutation of Spinoza, which includes a criticism on precisely this point (Letter IV to Serena, §11), Toland stresses the confusion engendered by this widespread equivocation. Spinoza (or an editor, likely acting with his approval) even flags his own use of the term 'motion' in this way in a note to the *Short Treatise*: "What is said here of Motion in matter is not said seriously. For the Author still intends to discover its cause, as he has already done, to some extent, a posteriori. But it can stand as it is here, because nothing is built on it, or depends on it" (KV I IX, G I 48/C 91). In short, Spinoza makes clear that motion presupposes Extension, but not that it presupposes extension, since there is no indication that he means translation in space by 'motion'.

So even if the infinite modes are intended to introduce divisibility into Extended substance, there is no reason to think that Spinoza intends that divisibility to be the sort of divisibility entailed by spatial extension. There is, furthermore, evidence that Spinoza does not take modes to be spatially extended. More precisely: there is evidence that Spinoza thinks that when we conceive modes of Extension as spatially extended, we conceive them inadequately, and not "as they are in themselves". We saw in §2 that Spinoza associates quantity₁ with the intellect and quantity₂ with the imagination, and with conception in "abstract" and "superficial" terms. To see the implication of these

35. See, for example, Tschirnhaus's Letter 84 to Spinoza. For an account of some later critiques of Spinoza on this point, see Schliesser 2014.

comments for the question of whether modes are extended in space, we have to discuss, as briefly as possible, Spinoza's view of the imagination and of abstraction.

The only one of Spinoza's three kinds of cognition that admits of inadequacy is the first kind — what Spinoza calls imagination, or the kind of cognition that “present[s] external bodies as present to us” by representing the affections of the body (EIIp45, G II 106/C 465). Spinoza associates the imagination with inadequate conception for two reasons. First, according to Spinoza, knowledge of nature “as it is in itself” and not “as it is related to human sense perception” (Ep. 6, G IV 28, C 181) should be grounded in knowledge of essences and of the real properties and effects of things that follow from their essences (*e.g.*, TIE 91). Imagination cannot give us knowledge of essences, but only about the effects of things on our bodies (*e.g.*, TIE 9, 13). Mistaking the one for the other is a primary source of error, according to Spinoza. Second, even were we correctly to interpret the data of the imagination as information about the effects of things on our bodies, we could not deduce their real properties therefrom without having complete knowledge of the whole of nature. That is because while the properties and behaviors of a thing taken in isolation flow from its essence, when it is instantiated in nature and infinitely subject to external causes, its actual properties and behaviors would tell us about its essence only if — *per impossibile* — we knew how it interacted with the rest of nature.³⁶

Now, Spinoza never says that imagination only furnishes inadequate ideas, only that it is the “only cause of falsity”.³⁷ But these considerations of the nature of the imagination suggest that it is impossible for it to give us adequate knowledge of physical things — of their essences and the real properties that follow therefrom.³⁸ But even if we allow that the imagination can sometimes yield (more or less)

36. See Ep. 6 (G IV 34–36/S 76) for Spinoza's critique of Boyle's experiments on this basis, and Ep. 32 (G IV 170–172/S 192) on the worm in the blood.

37. EIIp41, G II 122/C 478.

38. For further arguments to this effect, see Peterman 2014.

adequate knowledge of nature, we should at least be extremely wary of interpreting its reports as knowledge of “Nature, as it is in itself”.

The discussion of abstraction here must be an abridged one, but in short, Spinoza consistently holds up abstractions as villains of epistemology. All that exists, Spinoza writes, are particulars, and so all true knowledge is knowledge of particulars; abstracta are mere *entia rationis* (or worse — *entia imaginationis*) that tell us nothing about the nature of things considered in themselves (EIVp, G II 208/C 545). Their use in trying to understand real beings leads us into “absurdities” and “interferes with the true progress of the intellect” (TIE 75, 93, 99, G I 28, 34, 36/C 33, 39, 41). Now, there is some debate about whether Spinoza thinks that there are any adequate abstract ideas,³⁹ and if any abstract ideas were adequate, our idea of Extension would be one of them, as a common notion (EIIp43, G II 127/C 481). But in the contexts involving spatial extension that we are considering, it is clear that Spinoza understands abstraction to involve inadequacy and confusion. Moreover, abstraction, according to Spinoza, is a function of the imagination, whereby it identifies a property of things which it then uses to try to understand multiple things at once, which may be in other respects quite unlike one another. This may simplify nature so that it is graspable in some respects by our finite minds, but by smearing out the details of the essences of particular things. The geometrization of bodies would seem to be the ultimate abstraction, since it treats physical objects in terms of one universal property: their extension. So it is not surprising that Spinoza considers the kind of quantity involved in that geometrization a conception of the imagination.

In the “Letter on the Infinite”, Spinoza does not suggest that the confusion, inadequacy or “superficiality” that imagination and abstraction involved in conceiving things in terms of quantity₂ is mitigated when modes are conceived in these terms. Recall that Spinoza argues that we can determine measure and time only when we

39. For a defense of some kinds of abstraction on Spinoza’s behalf, see Hübner forthcoming. For another recent discussion of Spinoza on abstract objects, see Newlands.

“conceive Quantity abstracted from Substance and separate Duration from the way it flows from eternal things”, and only when “we separate the Affections of Substance from Substance itself and reduce them to classes so that as far as possible we imagine them easily, arises Number, by which we determine [these affections of substance]”. Thus, concludes Spinoza, “Measure, Time, and Number are nothing but Modes of thinking, or rather, of imagining”. He goes on to note that “it is no wonder that all those who have striven to understand the course of Nature by such Notions — which in addition have been badly understood — have so marvelously entangled themselves that in the end they have not been able to untangle themselves without breaking through everything and admitting even the most absurd absurdities”. Spinoza goes on to say that the modes of substance *themselves* should not be confused with these aids to the imagination — that is, as portions of quantity or duration determined by measure, time, and number. He writes:

And if the Modes of Substance themselves are confused with Beings of reason of this kind, or aids of the imagination, they too can never be rightly understood. For when we do this, we separate them from Substance, and from the way they flow from eternity, without which, however, they cannot be rightly understood (Letter 12 to Meyer, G IV 54/S 101).

This is not the only place that Spinoza stresses that failing to consider how finite things relate to substance leads to error — see the quote, cited earlier, that sees the “absurdities” of Descartes physics as originating in this failure. It suggests — and this is consistent with the rest of the language of the letter — that the inadequacy that accompanies conceiving things in terms of quantity₂ is not restricted to substance.⁴⁰

Let us return to the quote, cited earlier, that makes it sound as if Spinoza associates measurable, divisible quantity₁ with modes:

40. For an alternative reading of Letter 12, see Schliesser 2014.

When we have regard only to the essence of modes and not to Nature's order, as is most often the case, we can arbitrarily delimit the existence and duration of modes without hurting our conception of them, and conceive it as greater or less, or divisible into parts.

There is a way of reading this passage that does not entail that modes are properly understood as divisible. Spinoza has just finished explaining that the most important difference between substance and modes is that the essence of a substance cannot be conceived without existence, while the essence and the existence of modes are completely distinct from one another. So we can read this quote to mean that we can think of the existences of modes any way we want without "hurting our conception" of their essences. We can think of the existence of modes that way not because it's the right way to think about them, but because it simply does not matter, for their essences, what space or time they take up. In contrast, if we think of the existence of substance this way, we miss an important element of its essence. Again, it is not that the right way of conceiving of modes is as enduring and divisible, but only that, unlike in the case of substance, we do no damage to our conception of their essences by doing so, since their essences and existences are completely independent of one another.

The arguments above do not show that bodies are not "really" extended in space. I think that there is an interpretation of Spinoza on which modes, once they are instantiated, are extended and divisible *in some sense*. All that the arguments here establish is that when they are understood through their essences, "in themselves", or (to speak anachronistically) in terms of their most fundamental properties, they are extended and divisible. This does not necessarily reduce spatial extension to a "mere appearance". Spinoza sometimes distinguishes two ways of thinking about modes: as they flow from substance and as they are situated in the "order and connection of things". For example, speaking about the existence of singular bodies, Spinoza writes:

By existence here I do not understand duration, *i.e.*, existence insofar as it is conceived abstractly, and as a certain species of quantity. For I am speaking of the very nature of existence, which is attributed to singular things because infinite many things follow from the eternal necessity of God's nature in infinitely many modes (see Ip16). I am speaking, I say, of the very existence of singular things insofar as they are in God (Elp45, G II 148/C 423).

There is no indication here that duration "insofar as it is conceived abstractly, and as a certain species of quantity" is not real, and elsewhere Spinoza writes that enduring in time and space is a kind of actuality (EVp29s, G I 298/C 609). But it is clearly suggested that it is derivative, and that we do not understand things through their essences when we understand them in these terms. We might conceive of spatial extension on the model of duration that Spinoza provides here. There is plenty in Spinoza that suggests that bodies and their behaviors as we experience them are the result of an infinity of instantiated modal essences, and that the result of this is what Spinoza thinks of as the series, or order, of nature. But he treats this order, and the knowledge of it, as derivative from the more fundamental modal essences as they flow from God, understood under the attribute of Extension. There is much more to be said about this, but there is not the space to address it here. What is important is that spatial extension is not the fundamental attribute under which bodies and corporeal substance are conceived — it is not, that is, Extension.

§3c

On my reading of it, Spinoza is using the word "extension" in a very nonstandard way. Following Descartes, and even having written a reconstruction of Cartesian physics, why use this word in such a misleading way, without making it clear that he is redefining it?⁴¹ But

41. I am grateful to Martin Lin for pressing this objection to me.

while the absence of a characterization of Extension might suggest that Spinoza is simply adopting the Descartes' understanding of it, we might just as well wonder why Spinoza omits it when he pointedly includes it, on Descartes' behalf, in his reconstruction of Cartesian physics. There, Spinoza includes as the very first definition of Part II that "Extension is what consists of three dimensions; but by extension we do not understand the act of extending, or anything distinct from quantity". This last clause is Spinoza's own clarification, suggesting that Spinoza wishes to stress that Descartes Similarly, he clearly articulates Descartes' identification of matter and space: Definition 6 goes on to establish that "we make only a distinction of reason between space and extension", and Proposition 2 that "The nature of Body, or Matter, consists in extension alone...Space and body do not really differ". And the very last proposition of Part I is: "Substance extended in length, breadth, and depth really exists; and we are united to one part of it" (PPC Ip21, G I 179/C 261). In contrast, no definition of Extension, nor any identification of space and body, nor indeed any mention of "space" or "dimension" at all can be found in Spinoza's independent work.

Further, one of Descartes' primary motivations in identifying spatial extension as the primary attribute of bodies is surely his project to make physics tractable for mathematics. For Descartes, the best way to do this is to render the object of physics the pure object of geometry. If we are to have knowledge of the properties and knowledge of bodies a priori, they must be geometrical beings – that is, really extended and nothing else. Descartes does not merely think that mathematics is the language of the physical world; he believes that physics is nothing but geometry. In a letter to Clerselier, he writes that "mathematical extension is the principle of physics", and in *Principia* II, 64: "I do not admit or desire any other principles in physics than in geometry or abstract mathematics, since all the phenomena of nature are explained thereby."

As §3b began to suggest, Spinoza does not follow Descartes in this. While Descartes offers very similar critiques of abstraction, he ultimately excepts the geometrical properties of bodies from that critique on the

basis that we have a clear and distinct perception of extension as the essence of bodies (see, *e.g.*, Letter to Gibieuf, CSMK III 202).⁴² There is simply no indication that Spinoza makes any such exception.

Spinoza *is* retaining an important aspect of Descartes' usage of 'Extension' — namely, that it identifies the (principal) attribute of bodies. But he understands the meaning of the term differently. Perhaps we might imagine Spinoza to be using the word 'Extension' the way that one might use 'material' (or 'materialism') instead of 'physical' (or 'physicalism'), the former being well-entrenched, even after learning from the physicists that the physical includes more than just matter.

§4 Conclusion

If Spinoza does not mean "spatial extension" when he writes 'Extension', then what does he mean? I argued in the last section that we should not take Spinoza's reluctance to define Extension as a license to assume that he meant what Descartes meant by it. In conclusion, I'll offer some reasons why we should not expect Spinoza to define it at all.

Extension, like Thought, is an attribute, which the *Ethics* defines as "what the intellect perceives of a substance, as constituting its essence" (Eld4, G II 45/C 408). But in an early letter to Oldenburg, Spinoza defines an attribute as "whatever is conceived through itself and in itself, so that its concept does not involve the concept of another thing" (Ep. 2 to Oldenburg, G IV 7/C 165). There, God already is defined as a Being consisting of infinite attributes. Spinoza goes on to offer an example: "For example, Extension is conceived through itself and in itself, but motion is not."

What does it mean that an attribute must be "conceived through itself"? There is a suggestion of at least one of the implications of this phrase in the *Short Treatise*. There, Spinoza is objecting to a claim that any legitimate definition must be given by genus and difference. But Spinoza objects that if this is true, then one can know nothing. He reasons that if this is true, "then we can never know perfectly the

42. For more on Spinoza's critique of applied mathematics, see Peterman 2012 and Schliesser 2014.

highest genus, which has no genus above it". He goes on to conclude that the attributes in particular are "known through themselves" and that "we see that other things are only modes of those attribute, and without them can neither exist nor be understood".⁴³ We can take this to mean that knowledge of the nature of extension and motion will not, for Spinoza, be a characterization of them like Descartes' claim that Extension is three-dimensionality, or that motion is displacement from a neighborhood. But as Spinoza claims in the *Short Treatise*, this does not mean that we cannot know them at all. We can know them instead by the third and highest kind of knowledge, which, according to the *Short Treatise* (II xxii), is an "immediate manifestation of an object to the intellect" or "an awareness and enjoyment of the thing itself" which does not come from being convinced by reasons.⁴⁴

Passages like this indicate that according to Spinoza, an attribute cannot be characterized in terms of more basic concepts. Consider

43. In a letter to Princess Elizabeth (21 May 1643), Descartes also identifies extension as the primitive notion that pertains to body, just as thought is a primitive notion. He writes that "we go wrong if we try to explain one of these notions by another, for since they are primitive notions, each of them can be understood only through itself (AT 665–666, CSMK III 218).
44. There is further evidence for this reading of our knowledge of the attributes, based on the analysis of the common notions. But there is not the space to discuss it in detail here.

Descartes also identifies the (primary) attributes of Extension and Thought as highest genera, and warns against asking for the proximate genus, putting the following words in the mouth of his spokesman, Eudoxus: "... we must know what doubt is, what thought is, what existence is, before being convinced of the truth of this inference, 'I am doubting, therefore I exist', or what amounts to the same thing, 'I am thinking, therefore I exist.' But do not imagine that in order to know what these are, we have to rack our brains trying to find the 'proximate genus' and the 'essential differentia' which go to make up their true definition. We can leave that to someone who wants to be a professor or to debate in the Schools. ... [T]here are, in my view, some things which are made more obscure by our attempts to define them: since they are very simple and clear, they are perceived and known just on their own, and there is no better way of knowing and perceiving them" (CSM 417, AT VII 523). Descartes is responding here to objections, raised by the authors of the Sixth Set of Objections, that the *cogito* argument is unsound on the grounds that we cannot know whether any mind exists without first knowing what thinking is (CSM 278/AT VII 412). I am grateful to Anat Schechtman for pointing me to this passage.

trying to ask after the nature or definition of another attribute: Thought. Perhaps it is clearer in this case that an answer is not forthcoming, and that “Thought” is just a basic kind of thing. This does not itself mean that the attribute of Extension is not spatial extension; it may be that the basic kind of thing is something with spatial characteristics, and that its “immediate manifestation ... to the intellect” is the manifestation of something with those characteristics. But if it is not, and “Extension” means something else, we should not be surprised if it cannot be defined in any more basic terms. If that’s right, then to talk about “Extended” nature is just to talk about material or physical nature, and by Extended things Spinoza just means something like material or physical things.

Of course, to discover the implications of this for Spinoza’s physics is a much more complicated project; this is just to gesture toward an answer to a question that the earlier sections of this paper are likely to raise. There is lots of interesting work to be done in figuring out the details of Spinoza’s account of the physical (and also, very likely, the precise extent to which he was not able to work them out). Here, I hope only to have offered some reasons to think that Spinoza’s critique of Cartesian physics starts much deeper than most interpreters have thought: in the very understanding of the physical itself, as first and foremost possessing the property of being extended in space.

Bibliography

Works by Spinoza

- Spinoza, Benedict de. *The Collected Works of Spinoza*, Volume 1. Trans. Edwin Curley. Princeton: Princeton University Press, 1985.
- _____. *The Letters*. Trans. Samuel Shirley. Indianapolis: Hackett Publishing Company, Inc., 1995.

Spinoza on Extension

Other Works

- Bayle, Pierre. *Dictionnaire Historique et Critique*. URL: <http://artfl-project.uchicago.edu/node/60>, 1740 edition, 253.
- Bennett, Jonathan. *A Study of Spinoza's Ethics*. Indianapolis: Hackett Publishing Company, Inc., 1984.
- Berkeley, George. "Essay Towards a New Theory of Vision". <http://www.gutenberg.org/ebooks/4722>. 1732.
- _____. *A Treatise Concerning the Principles of Human Knowledge* (1710). Ed. Kenneth Winkler. Indianapolis: Hackett Publishing Company, Inc., 1982.
- _____. *The Works of George Berkeley, Bishop of Cloyne*. Eds. A. A. Luce and T. E. Jessop. London: Thomas Nelson and Sons, 1948–1957.
- Clarke, Samuel; Leibniz, Gottfried Wilhelm, Collins, Anthony, and Bulkely, Richard. *A collection of papers, which passed between the late learned Mr. Leibnitz and Dr. Clarke, in the years 1715 and 1716, 1717*.
- Cottingham, John; Stoothoff, Robert; Murdoch, Dugald, trans. *The Philosophical Writings of Descartes*, three volumes. Cambridge: Cambridge University Press, 1984–1991.
- Curley, Edwin M., ed. and trans. *The Collected Works of Spinoza*. Princeton: Princeton University Press, 1985.
- _____. *Spinoza's Metaphysics: An Essay in Interpretation*. Cambridge, Mass: Harvard University Press, 1969.
- Douglas, Alexander. "Spinoza and the Dutch Cartesians on Philosophy and Theology". *Journal of the History of Philosophy* 51(4), October 2013, 567–588.
- Fraenkel, Carlos. "Hasdai Crescas on God as the Place of the World and Spinoza's Notion of God as Res Extensa". *Aleph: Historical Studies in Science and Judaism* 9(1), 2009, 77–111.
- Gaukroger, Stephen. *Baruch de Spinoza: Ethik in geometrischer Ordnung dargestellt*. Eds. Michael Hampe and Robert Schnepf. Berlin: Akademie Verlag, 2006.
- Gebhardt, Carl, ed. *Opera*, in four volumes. Heidelberg: Carl Winter, 1925.

- Grant, Edward. *Much Ado about Nothing: Theories of Space and Vacuum from the Middle Ages to the Scientific Revolution*. Cambridge: Cambridge University Press, 1981.
- Gueroult, Martial. *Spinoza I & 2*. Paris: Aubier Montaigne, 1997.
- Hallett, H.F. *Benedict de Spinoza: The Elements of His Philosophy*. London: Athlone Press, 1957.
- Hübner, Karolina. "Spinoza on essences, universals and beings of reason". Forthcoming in *Pacific Philosophical Quarterly*.
- Hume, David. *A Treatise of Human Nature*, edited by David Fate Norton and Mary J. Norton, Oxford/New York: Oxford University Press, 2000.
- Lachterman, David R. "The Physics of Spinoza's Ethics". *Southwestern Journal of Philosophy* 8(3), Fall 1977, 71–111, 1971.
- Leibniz, G.W. *Philosophical Essays*. Ed. and trans. Roger Ariew and Daniel Garber. Indianapolis: Hackett Publishing Company, Inc., 1989.
- Maimonides, Moses. *Guide for the Perplexed*. Trans. M. Friedländer. 1903.
- Manning, Richard, "Spinoza's Physical Theory", The Stanford Encyclopedia of Philosophy (Spring 2012 Edition), Edward N. Zalta (ed.) <http://plato.stanford.edu/archives/spr2012/entries/spinoza-physics/>.
- Melamed, Yitzhak. "Spinoza's Metaphysics of Substance: The Substance-Mode Relation as a Relation of Inherence and Predication". *Philosophy and Phenomenological Research* 77 (1), January 2009, 17–82.
- _____. *Spinoza's Metaphysics: Substance and Thought*. Oxford: Oxford University Press, 2013.
- Newlands, Samuel. "Spinoza's Early Anti-Abstractionism". Forthcoming in *The Young Spinoza*. Ed. Yitzhak Melamed.
- Pasnau, Robert. *Metaphysical Themes 1274–1671*. Oxford: Oxford University Press, 2013.
- Peterman, Alison. "Spinoza on Physical Science". *Philosophy Compass* 9(3), March 2014, 214–223.

Spinoza on Extension

- _____. "Spinoza on the 'Principles of Natural Things'". *The Leibniz Review* 22, December 2012, 37–65.
- Schliesser, Eric. "Angels and Philosophers: With A New Interpretation of Spinoza's Common Notions". *Proceedings of the Aristotelian Society* CXI (3), 2011, 497–518.
- _____. "Spinoza and the Philosophy of Science: Mathematics, Motion and Being". In *The Oxford Handbook of Spinoza*, ed. Michael Della Rocca. Oxford: Oxford University Press, 2014.
- Schmaltz, Tad M. "Spinoza on the Vacuum". *Archiv für Geschichte der Philosophie* 81(2), January 1999, 174–205.
- Shirley, Samuel, ed. and trans. *Spinoza: The Letters*. Indianapolis and Cambridge: Hackett Publishing Company, Inc., 1995.
- Woolhouse, R.S. *Descartes, Spinoza, Leibniz: The Concept of Substance in Seventeenth Century Metaphysics*. London: Routledge, 1993.