Space Before God? A Problem in Newton's Metaphysics

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Abstract

My goal in this paper is to elucidate a problematic feature of Newton's metaphysics of absolute space. Specifically, I argue that Newton's theory has the untenable consequence that God depends on space for His existence and is therefore not an independent entity. I argue for this conclusion in stages. First, I show that Newton believed that space was an entity and that God and space were ontologically distinct entities. Part of this involves arguing that Newton denies that space is a divine attribute. I then show that Newton endorsed a principle according to which the existence of space is a necessary condition for the existence of any other entity. Following this, I discuss the ways in which this makes God depend on space for His existence and the reasons why this is unacceptable for traditional conceptions of God. Specifically, I show that it is incompatible with the orthodox position that God be entirely independent and self-determining. Finally, I offer two considerations which, I hope, make the problem seem less serious than it first appears. The first consideration has to do with Newton's polemical context and the second has to do with the nature of his theological thought.

1. Introduction

It is now widely recognized that there is an extremely close link between Newton's metaphysical and theological thinking and his doctrine of absolute space. And while the importance of absolute space for Newtonian physics is acknowledged, it is largely agreed that in the context of the seventeenth and eighteenth centuries, neither scientific considerations nor empirical evidence alone was sufficient to establish the existence of absolute space. I think that this trend toward understanding Newton's theory of absolute space as a theological and metaphysical position, rather than a strictly scientific one, has been a positive development. My purpose in this paper, however, is to suggest that it is not entirely unproblematic.

Specifically, my goal in this paper is to argue that Newton's theory of absolute space has an untenable theological consequence; Newton's theory entails that God depends on space for His existence

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and is therefore not an independent entity.[1] I shall argue for this conclusion in stages. In Section 2 I shall show that Newton believed that space was a being. In section 3 I shall show that Newton believed that God and space were ontologically distinct beings. In Section 4 I shall show that Newton believed that the existence of space was a necessary condition for the existence of any other being. In Section 5 I shall discuss the ways in which this makes God depend on space for His existence and the reasons why this is unacceptable for traditional conceptions of God. Finally, in Section 6 I will consider Newton's polemical context and the nature of his theological thought. My hope is that these considerations will make this problem seem less serious than it first appears.

2. Space as a Being

The goal of this section is to show that Newton believed that space was a really existing being.[2] This serves to distinguish Newton from many of his contemporaries. Leibniz famously argued that space was merely a series of relations. So Leibnizian space, unlike Newtonian space, is not a fundamental feature of the universe. Closer to home, Isaac Barrow had argued that space was pure possibility. Space had no reality of its own, but offered the possibility of location to objects which were real.[3] A third view comes from Walter Charleton. For him space was not a potentiality for being, as in Barrow, but rather a negation of being. Charletonian space was pure void or pure nothingness.[4] Newton was aware of views like these, but rejected them in favor of one which reifies space.

[1] I have chosen to focus on Newton's theory of absolute space for this paper. But I think that a similar problem could, *mutatis mutandi*, be created for Newton's theory of absolute time.

[2] 'Being' is, of course, a difficult term. A primary goal of this section is to make more precise the sense in which Newton understood space to be a being. In the relevant texts Newton offers us four ontological categories: substance, being, accident, and affection. Newton is very clear that space is neither substance nor attribute. He also is clear that it is an affection. But, membership in these categories is not mutually exclusive. God, for example, is a substance as well as a being. I will argue that space is a being as well as an affection.

[3] See Isaac Barrow, *The Usefulness of Mathematical Learning…* (London: Printed for Stephen Austen, 1734), 175ff.

[4] See Walter Charleton, *Physiologia Epicuro-Gassendo-Charltoniana* (London: Printed by Thomas Newcomb, 1654), book 1, chapters 3 and 6.

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The most important text for understanding Newton's views on space is an early manuscript known as *De Gravitatione*. In this text Newton makes explicit his belief that space is a really existing entity. He writes that space 'has its own manner of existing which is proper to it and which fits neither substances nor accidents'.[5] Newton has two reasons for denying that space is a substance. The first is that space 'is not absolute in itself'.[6] Newton's suggestion here is that space is an affection of being; this means in order for space to exist some other being must also exist. A substance, unlike a property or accident, was traditionally thought to depend on nothing else for its existence.[7] Newton's second, and more important, reason for denying that space is a substance is the fact that space does not act. Indeed, space is causally inert, incapable of acting on its own or of being acted upon. Newton's argument that space is not an accident is as follows. There is no one particular thing which is necessary for the existence of space. We can imagine a variety of objects coming into and going out of existence without any change to space's nature. This shows that space does not inhere in and does not depend on any one particular object for its existence and so cannot properly be considered an accident.[8]

So Newton's claim is that space does exist as a real being, but that it is a very special kind of being. Put differently, I read Newton as arguing that the set of existing beings is not exhausted by the subsets of substances and accidents. There are really existing beings which can properly be classified as neither. This is why Newton speaks of space as 'having its own manner of existing which is proper to it and which fits neither substances nor accidents'.[9] Space exists in a *way* or *manner* which is different from the way or manner that substances and their accidents do. This is why it can be classified as a different type of being.[10]

[5] Isaac Newton, *Philosophical Writings* (hereafter *NWP*), (ed.) Andrew Janiak (Cambridge: Cambridge University Press, 2004), 21.

[6] Newton, *NPW*, 21.

[7] Consider, for example, Descartes' claim in the *Principles* (Part 1, Section 51) that created minds and bodies are not, strictly speaking, substances because they depend on God for their existence. René Descartes, *The Philosophical Writings of Descartes*, (eds) John Cottingham, Robert Stoothoff, Dugald Murdoch (New York: Cambridge University Press, 1985), 210.

[8] See the related discussion in Janiak. Andrew Janiak, *Newton as Philosopher* (New York: Cambridge University Press, 2008), 145.

[9] Newton, *NPW*, 21.

[10] It follows from this that I agree with others in the literature who have rejected a substantivalist-relationist dichotomy as inappropriate for

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Consider another passage from *De Gravitatione* in which Newton makes it explicit that he believes space is a really existing entity: 'it is usually believed that these spaces [the ones devoid of body] are nothing; yet indeed they are spaces. Although space may be empty of body, nevertheless it is not in itself a void; and something is there, because spaces are there, although nothing more than that'.[11] Here Newton takes himself as correcting a common error. Some people consider empty space to be devoid of being. But this is incorrect, because space itself is a being, in empty space there is some *thing*, namely space itself. Note as well the relative independence that space is given in this quote. Space is not presented as having derivative being. The explanation of the being present in empty spaces stops at the mere existence of space: 'spaces are there, although nothing more than that'.

At one other point in *De Gravitatione* Newton affirms the real existence of space. The occasion for this is a comparison of space to Aristotelian prime matter. Newton writes that 'They differ, however, in that extension (since it [involves] "what" and "how constituted" and "how much") has more reality than prime matter…'[12] Here Newton has a Scholastic concept of prime matter in mind: something which is either pure potency or has the lowest possible level of actuality. Newton very carefully points out that space has more reality than prime matter. So again, we get the view that space is a really existing entity, one which has its own (relatively high level of) reality and its own manner of existing.

Newton's view that absolute space was a really existing being also surfaces in the *Principia*. The Scholium on space and time makes the following claim: 'Absolute space, of its own nature without reference to anything external, always remains homogeneous and immovable'.[13] This passage is important for two reasons. The first is that Newton suggests here that space has its own nature. The language of natures offers us some *prima facie* reason for thinking that

classifying Newton's views. See, for example, Janiak, *Newton as Philosopher*, 155; Edward Slowik, 'Newton's Neo-Platonic Ontology of Space', *Foundations of Science* **18** (2013), 419–448; and Edward Slowik, 'Newton's Metaphysics of Space: A *"Tertium Quid"* betwixt Substantivalism and Relationism, or merely A "God of the (Rational Mechanical) Gaps"?', *Perspectives on Science* **17** (2009), 429–456.

[11] Newton, *NPW*, 26–27.

[12] Newton, *NPW*, 29.

[13] Newton, *NPW*, 64.

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Newton thinks space is a being.[14] Secondly, Newton's suggestion that we can consider space in isolation from other beings ('without reference to anything external') suggests it has some being. If space were just a product of relations between material objects or a pure potentiality or nothing, then considering it apart from other beings would be impossible.

Perhaps the most decisive piece of evidence for the claim that Newton believed that space was a real being is a passage from the manuscript known as *Tempus et Locus*. This manuscript closely resembles certain passages from *De Gravitatione* and suggests that Newton's position on space remained consistent from the time he composed *De Gravitatione* through the first edition of the *Principia*. In this manuscript Newton explicitly claims that space is a being (*ens*): 'For it is a single being, [most simple], and most perfect [in its] kind'.[15] So several important Newtonian texts give us reason to think that he understood space to be a really existing being.

Before moving on, I want to discuss the work of one commentator who might be seen as offering a dissenting view. Andrew Janiak has denied that Newton believed that space was a being:

> …in addition to being contingent, space and time are also not beings, and are therefore not necessary beings. Unlike contingent beings such as ordinary objects and human minds, which…are substances that bear characteristic actions, space and time are causally inert and therefore fail a crucial Newtonian criterion of substancehood. Space and time are mere affections, and not genuine substances. Thus for Newton, space and time are merely contingent and are mere affections.[16]

[14] On this point see J.E. McGuire, 'A Dialogue with Descartes: Newton's Ontology of True and Immutable Natures', *Journal of the History of Philosophy* **45** (2007), 103–125. He argues that Newton adopted some relevant components of Descartes' theory of natures. Specifically, Newton adopted the view that natures, in and of themselves, determine the structure or content of some being. So, in claiming that space either is or has a nature Newton is claiming that space is a conceptually independent and positive being.

[15] *Tempus et Locus*, §3. The text of *Tempus et Locus* has been transcribed and translated in J.E. McGuire, 'Newton on Place, Time, and God: An Unpublished Source', *The British Journal for the History of Science* **11** (1978): 114–129. For this passage see page 117. The Latin reads: 'Est enim ens unicum, simp[licissimum & in suo] genere perfectissimum'.

[16] Janiak, *Newton as Philosoher*, 147.

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It will be worthwhile to spend a few moments analyzing this claim. When properly understood I believe that this quotation, far from giving us reason to doubt that space is a being, can actually help us to understand the exact sense in which Newton believed space to be a being.

Janiak is perfectly correct to note that for Newton space and time are not substances. His characterization of space as an affection is also unproblematic. And Janiak is perfectly correct to think that we can infer that '*x* is not a substance' from the claim that '*x* is a mere affection'. What is troubling about this passage, however, is that Janiak also seems to think that we can move from the claim that '*x* is not a substance' to the conclusion that '*x* is not a being'. This is the move which I think is questionable. Janiak offers us no independent reason for thinking that Newton restricts the set of beings to the set of substances.

My position is that when we consider the polemical goals of *De Gravitatione* we realize that Newton was consciously trying to avoid just this sort of restriction. As Janiak himself points out, a major goal of *De Gravitatione* is to develop a metaphysic which is non-Cartesian (and non-Scholastic). In the course of doing this, one thing which Newton does is reject the claim that all entities can be classified as substances or attributes. Indeed, Newton carves out a special metaphysical category (affections) for entities (space and time) which are neither substances nor attributes. Given all of this, and given Janiak's careful work to show the sense in which Newtonian space is not a Newtonian substance, I think we can reformulate Janiak's claim that space is not an entity. We can more charitably read Janiak as claiming that space is not a *substance*.[17] If we read him this way then we can both agree that Newton denies that space is a substance, but does think that it is an entity (in the looser sense of the term).

3. Space as Distinct from God

Understanding that, for Newton, space was an entity distinct from God is, in a sense, difficult. It is difficult because it requires understanding that Newton differed from some of his contemporaries who held very similar views. Specifically, it involves understanding how Newton was different from his most immediate predecessor on the topic, Henry More, and how he was different from his most

[17] Put differently, Janiak's use of 'being' is more restricted than mine.

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immediate successor on the topic, Samuel Clarke. These writers identified God with space. I will show that this is a position which Newton consciously and consistently rejected.[18]

Henry More's views on the nature of space were both complicated and subtle. Furthermore, they underwent significant changes throughout his career.[19] Nevertheless, I think it is uncontroversial that More's mature position held that absolute space was to be understood as a divine attribute.[20] Samuel Clarke followed More in claiming that space was a divine attribute.[21] In his 5th Letter to Leibniz he writes as follows:

> God does not exist in space and in time; but his existence causes space and time. And when, according to the analogy of vulgar speech, we say that he exists in all space and in all time; the words mean only that he is omnipresent and eternal, that is, that boundless space and time are necessary consequences of his existence; and not, that Space and Time are beings distinct from him, and in which he exists.[22]

So here Clarke explicitly denies that God and space are distinct beings.[23] Given Newton's general intellectual debt to More, his

[18] It is important to note that the goal of this section is extremely limited. I am only concerned with making a *negative* argument to the effect that Newton thought God and space were ontologically distinct. I do not intend to offer a *positive* interpretation of how Newton did understand the relationship between God and space. There are well-known and much discussed questions about, for example, Newton's doctrine of emanation, whether it is divine or general, whether it is causal, and if so what sort of causality it employs, etc. But discussion of these issues is beyond the scope of this paper. Beyond denying that space and God are ontologically linked and showing that God requires space, I wish to remain neutral on the character of the relationship between them.

[19] See Jasper Reid, 'The Evolution of Henry More's Theory of Divine Absolute Space', *Journal of the History of Philosophy* **45** (2007), 79–102.

[20] For example, Henry More, *Manual of Metaphysics*, (ed.) Alexander Jacob (New York, Olms 1995), volume **1**, 56–58.

[21] And Clarke was joined by other early 18th century Newtonians. See George Cheyne, *Philosophical Principles of Natural Religion* (London: Printed for George Strahan, 1705), 19–20 and Samuel Colliber, *An Impartial Inquiry into the Existence and Nature of God…* (London: Printed and sold by the booksellers, 1718), 218–219.

[22] G.W. Leibniz and Samuel Clarke, *Correspondence*, (ed.) Roger Ariew (Indianapolis: Hackett Publishing Company, 2000), 71.

[23] Part of Clarke's motivation may have been that he thought it was impossible for there to be two necessary beings. Clarke had argued for

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personal association with More and Clarke, Clarke's general fidelity to Newton's own views, and some indirect evidence which suggests that Newton had a hand in Clarke's letters,[24] we might have reason to wonder if Newton also thought space was part of God.

Some interpreters have been convinced by these considerations and have argued that Newton, like Clarke and More, did identify God with space. The American Samuel Johnson, in his correspondence with Berkeley, was perhaps one of the earliest interpreters to take this position.[25] John Tull Baker, in his seminal work on early modern conceptions of space and time in England, argued that Newton conceived of space and time as divine attributes.[26] In this, he was followed by Edward Grant.[27] More recently, Edward Khamara, in summarizing the Newtonian position on space, writes that 'In relation to God, however, space and time are not substances but properties: and constitute respectively the divine attributes of immensity (or omnipresence) and eternity (i.e. sempiternity)'.[28] Geoffrey Gorham has very recently defended the divine attribute reading as well.[29]

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this position in Proposition VII of his *A Demonstration of the Being and Attributes of God*. See Samuel Clarke, *A Demonstration of the Being and Attributes of God*, (ed.) Ezio Vailati (New York: Cambridge University Press, 1998), 35–38.

[24] For this evidence see Alexandre Koyré and I. Bernard Cohen, 'Newton and the Leibniz-Clarke Correspondence' *Archives Internationales d'Histoire des Sciences* **15** (1962), 63–126.

[25] 'External space and duration therefore I take to be those properties or attributes in God… This I take to be Sir Isaac Newton's meaning…' George Berkeley, *A Treatise Concerning the Principles of Human Knowledge*, ed. Jonathan Dancy (New York: Oxford University Press, 1998), 178.

[26] John Tull Baker, *An Historical and Critical Examination of English Space and Time Theories from Henry More to Bishop Berkeley* (Bronxville, NY: Sarah Lawrence College, 1930). At page 3: 'Both the *Principia* and *Optics* consider absolute space and time God's attributes like More and Barrow'. See also pages 29–30. It is worth noting that Baker only had access to the *Principia* and the *Optics* and not to the wealth of Newton manuscripts available to scholars writing today.

[27] Edward Grant, *Much Ado About Nothing: Theories of Space and Vacuum from the Middle Ages to the Scientific Revolution* (New York: Cambridge University Press, 1981), 243–244.

[28] Edward J. Khamara, *Space, Time, and Theology in the Liebniz-Newton Controversy* (Frankfurt: Ontos, 2006), 25.

[29] Geoffrey Gorham, 'Newton on God's Relation to Space and Time: The Cartesian Framework', *Archiv für Geschichte der Philosohpie* **93** (2011): 281–320.

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In the following paragraphs I want to contest these interpretations. My position is that there is decisive evidence that Newton disagreed with Clarke and More on this point and claimed that God and space were distinct entities. I will first consider some passages which directly show Newton claiming we should resist the urge to identify space and God. Then I will show that some of Newton's other claims about space are incompatible with a reading of space as a divine attribute.

One text in which Newton warns us against identifying God with space comes in the General Scholium to the *Principia*: '[God] is not eternity and infinity, but eternal and infinite; he is not duration and space, but he endures and is present'.[30] I read this passage as a straightforward denial that space and God are in any way the same thing ('he is not… space'). While it is not appropriate to say of God that He *is* space, it is appropriate to say of God that He is *present*. Put differently, Newton in this passage wants to emphasize that God is intimately related to space, to emphasize that God is in all parts of space, to emphasize that space modifies God with regard to location, but not to suggest that space is part of God. A second, similar, passage occurs in *Tempus et Locus* §4: 'By reason of its eternity and infinity space will neither be God nor wise nor powerful nor alive…'[31] Newton here claims that although space and God share some features (they are both eternal and infinite), it would be a mistake to identify them or to associate space with God's power and wisdom. So in this passage we get an explicit comparison between the way in which space is extended (which does not make it perfect) and the way in which God is extended (which does make Him perfect).

The most decisive evidence that Newton believed God and space were distinct entities comes from the preface (*Advertissement au Lecteur*) which he wrote for a 1720 Amsterdam edition of the Leibniz-Clarke correspondence edited by Pierre Des Maizeaux. Newton wrote several drafts of this piece and they consistently show he was eager that readers not attribute to him the view that space is a divine attribute. Here is the text of Draft A, the

[30] Newton, *NPW*, page 91.

[31] Transcribed in McGuire, 'Newton on Place, Time, and God', 119. Compare with Newton, *NPW*, 25: 'But I see what Descartes feared, namely that if he should consider space infinite, it would perhaps become God because of the perfection of infinity. But by no means, for infinity is not perfection except when it is attributed to perfect things'.

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language of which is closely replicated in the other four extant drafts:[32]

> The Reader is desired to observe that wherever in the following papers, through unavoidable narrowness of language, infinite space or Immensity & endless Duration or eternity, are spoken of as Qualities or Properties of the Substance w^{ch} is Immense or Eternal, the terms Quality & Property are not to be taken in that sense wherein they are vulgarly, by the writers of *Logick & Metaphysicks* applied to *matter*; but in such a sense as only implies them to be CONSEQUENTS of the Existence of a Being which is really necessarily & substantially Omnipresent & Eternal…[33]

Here again we have Newton insisting that the relationship between space and God is extremely tight, yet still denying that they are the same thing. Space is more like an effect of God than like a feature or part of God.

So much for Newton's direct claims about the non-identity of space and God. I now want to consider some passages which motivate indirectly against the divine attribute reading. But in order to see how these passages do this it is necessary to say a little bit about how early modern philosophers thought about attributes. There are, broadly speaking, two ways of thinking about attributes: either as 1) ways of conceiving a substance or as 2) features of a substance which inhere in it. I think Newton makes claims about space which are inconsistent with space being an attribute according to either conception.

The first view about attributes holds that an attribute is just a manner in which a substance in conceived.[34] Omnipotence, for example, on this view is just one way of thinking about the perfectly simple substance that is God. So space, on this view is just one way of considering the divine essence; thinking about space is really just thinking about God. Henry More seemed to favor this understanding of space as a divine attribute. He often claims that space is an 'image'

[32] I follow Koyré and Cohen in classifying the drafts as Drafts A-E. For details about and transcriptions of the drafts see Koyré and Cohen, 'Newton and the Leibniz-Clarke Correspondence', 96ff.

[33] Koyré and Cohen, 'Newton and the Leibniz-Clarke Correspondence', 96.

[34] This understanding of attributes is the one employed by Gorham. For a clear exposition of this understanding of attributes in a Cartesian context see Lawrence Nolan, 'Reductionism and Nominalism in Descartes's Theory of Attributes', *Topoi* **16** (1997), 129–140.

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or a 'representation' of God.[35] He means that space is one of the ways in which human minds imagine, represent, or conceive of God.[36] I think that Newton could not have shared this view with More. The reason is that Newton believes we can conceive of space *without* conceiving of God. Consider the following passage:

> If we say with Descartes that extension is body, do we not manifestly offer a path to atheism, both because extension is not created but has existed eternally, and because we have an idea of it without any relation to God, and so in some circumstances it would be possible for us to conceive of extension while supposing God not to exist?[37]

On the view I am proposing, in which God and space are ontologically distinct, we can make perfect sense of this passage. We can conceive of space without God *because they are distinct things*.[38]

Gorham has denied that this is a decisive text against the attribute interpretation. His argument is that Newton is operating within a Cartesian context where it is possible to conceive of extension without God. Newton, according to Gorham, must reject this possibility on pain of being complicit in this atheism.[39] I think Gorham has this backwards. Descartes makes it abundantly clear that extension cannot be conceived apart from God, this is why extension is not, properly speaking, a substance. So given that it is not Descartes' position that God and extension can be conceived distinctly, it follows that it must be Newton's position that we can conceive of space apart from God. Further evidence that Newton is speaking in his own voice (and not channeling Descartes) comes from the fact that he claims that extension is not created and has existed eternally. Again, this is a position which is clearly Newton's and is clearly not Descartes'. How, given that he thinks space can be conceived apart

[35] For example, 'I have always been prone to think this subtile Extension….to be a more obscure shadow or adumbration, or to be a more general and confused apprehension of the *Divine Amplitude*'. Henry More, *Divine Dialogues* (London: Printed by James Flesher, 1668), 106. It is worth noting that Newton never, to my knowledge, uses this sort of language to characterize space.

[36] Thanks to Jasper Reid for helping me understand More's language of images and representations.

[37] Newton, *NPW*, 31.

[38] That said, conceiving of space may require conceiving of *some* object, the important point is that object does not need to be God.

[39] See Gorham, 'Newton on God's Relation to Space and Time', 287–288.

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from God, does Newton avoid the charge of atheism? Newton claims that although conceiving of space does not require conceiving of God, conceiving of *bodies* does (as Gorham goes on to note). So what Newton is attacking in this passage is the Cartesian equation of bodies with space; it is this conflation, and not the ontological distinction between God and space, that leads to atheism.

A second view about attributes treats them more like properties. On this view, attributes are things that inhere in their substances. So on this understanding of attributes, space inheres in God. I think this cannot be Newton's view. Consider this passage from *De Gravitatione*: 'And much less may [space] be said to be nothing, since it is something more than an accident, and approaches more nearly to the nature of a substance.'[40] If Newton really did think of space as this sort of divine attribute then presumably it would be more natural to speak of space as an accident than to speak of it as a substance. On the view which identifies God with space, space is dependent on God for its being which makes it entirely unlike a substance. But here we have Newton claiming that it is more like a substance (which has its own being) than like an accident (which inheres in a substance).

This passage is even more striking when we consider what comes just before it. Newton has delineated the two reasons why space does not qualify as a substance. He thinks it is 1) incapable of existing alone[41] and 2) incapable of action. In the analysis of these two reasons Newton provides us with an interesting counterfactual: 'yet everyone tacitly understands [that substances are capable of action], as follows from the fact that they would readily allow extension to be substance in the matter of body if only it were capable of motion and of sharing in the actions of body.'[42] Here Newton writes that *if* space could act then it would be substance. But this counterfactual would be nonsensical if Newton understood space as an attribute. The reason is that it is impossible for an attribute-like thing to gain the power of acting. Because attributes are ontologically linked to substances, and because substances are the proper *loci* of actions, it is nonsensical

[40] Newton, *NPW*, 22. Compare with Newton, *NPW*, 33 where Newton says that because we can think of space without any bodies in it 'some substantial reality fits this'.

[41] That said, Newton does not think that space cannot exist on its own in the way that material bodies cannot exist on their own. He thinks that material bodies are dependent on God for their existence in a way that space is not dependent on God for its existence. See Newton, *NPW*, 32–33.

[42] Newton, *NPW*, 21.

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to claim that an attribute (as opposed its substance) could act. Consider a pole-vaulter and one of her attributes, her strength. Now, it makes perfect sense to say that her strength *allowed* the pole-vaulter to jump over the bar or to say that a pole-vaulter jumps over a bar *in virtue of* her strength. But it is a serious logical error or a category mistake to claim that a pole-vaulter's strength jumps, or could jump, over the bar. And there is something bizarre about considering a counterfactual in which the pole-vaulter's strength gained the power to act while still being the pole-vaulter's strength.[43]

On the view I am proposing, however, we can make perfect sense of this passage. I am arguing that space is a really existing being which is neither a substance, nor an attribute, nor an accident. Space has its 'own manner of existing.' Now if we imagine space as a really existing being, there is no logical obstacle to imagining it as existing with causal powers. On the understanding of space as an attribute, however, for it to be considered a substance it would have to do two things. First, it would have to acquire causal powers. Second, it would have to, somehow, ontologically detach itself from its substance (God). On my view, which has space already existing as an independent being, only the first of these steps would be necessary. This better fits with the sense of Newton's counterfactual claim.

My hope is that at this stage it should be clear that Newton rejected any position which understood space as a divine attribute.

4. Newton's Spatial Criterion for Existence

In this section I will show that Newton adhered to a certain metaphysical axiom or principle. This principle holds that the existence of space is a necessary condition for the existence of anything else. One particularly succinct and forceful presentation of this Newtonian claim comes from *Tempus et Locus*. Newton begins this manuscript by writing that 'Time and Place are common affections of all things *without which nothing whatsoever can exist*.'[44] *De Gravitatione* contains very similar language: 'Space is an affection of being just as being. No being exists or can exist which is not

[43] I think that this argument against the second (inherence) way of understanding space as a divine attribute is also successful as an argument against the first (conceiving) way of understanding space as a divine attribute.

[44] *Tempus et Locus* §1. McGuire, 'Newton on Place, Time, and God', 117. Emphasis added.

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related to space in some way. God is everywhere, created minds are somewhere, and body is in the space that it occupies; and whatever is neither everywhere nor anywhere does not exist. And hence it follows that space is an emanative effect of the first existing being, for if any being whatsoever is posited, space is posited.'[45]

I think these texts are sufficient to demonstrate that Newton held the following:

> **Spatial Criterion for Existence (SCE):** For any being to exist it must exist in space.[46]

There are two important features of the SCE which deserve attention and there are two important questions about the SCE which deserve discussion. The two features are its modal status and its scope. The SCE has the modal status of necessity. For a being to exist, it *must* exist in space. Existing things *necessarily* exist in space. The scope of the SCE is universal. For *any* being to exist it must exist in space. *All* beings require space to exist in. The necessity and universality of the SCE embed it deeply in Newton's conceptual thought; it acts as a grounding or fundamental metaphysical principle.

The first interesting question about the SCE is *why* did Newton adhere to the SCE? Providing a complete answer to this question is outside the scope of this paper, but there are two considerations which I think are relevant.

[45] Newton, *NPW*, 25. Newton even deploys this view in controversy: 'Nor is the distinction between mind and body in [Descartes'] philosophy intelligible, unless at the same time we say that mind has no extension at all, and so is not substantially present in any extension, that is, exists nowhere; *which seems the same as if we were to say that it does not exist*…' Newton, *NPW*, 31. Emphasis added.

[46] Other commentators have noticed Newton's commitment to the SCE. Consider, for example, J.E. McGuire, 'Existence, Actuality and Necessity: Newton on Space and Time', *Annals of Science* **35** (1978), 481: '…space is…conceived as the general condition required for the existence of any individual substance including its characteristics'; McGuire, 'A Dialogue with Descartes', 123: '…the uncreated extension of space is, as such, an eternal precondition for the existence of all entities, God included'; Khamara, *Space, Time, and Theology*, 24: 'Absolute space and absolute time are necessary beings which exist in all possible worlds. They are held to be preconditions of all being, whether actual or possible'; and John Henry, 'Gravity and *De Gravitatione*: The Development of Newton's Ideas on Action at a Distance', *Studies in History and Philosophy of Science* **42** (2011), 17: '…Newton wants to insist that God must exist in space, in order to exist at all (a metaphysical point about the nature of existence)…'

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The first relevant consideration is the fact that Henry More also held a version of the SCE.[47] Consider the following passage from the preface to his *Immortality of the Soul*: 'For, to take away all Extension, is to reduce a thing onely to a Mathematical point, which is nothing else but pure Negation or Non-entity … it is plain that if a thing be at all, it must be extended.'[48] We know that Newton was a careful reader of More and thought highly of him. It is possible he simply adopted this view from More. But the mere fact that More held a similar position, or that such a position was 'in the air' at the time, does not really supply us with a *reason* for Newton to have held the SCE, it can only be a relevant consideration. Furthermore, as we saw above, and as his student notebooks make clear, Newton was certainly no slavish adherent of More's views.[49] This brings us to the second relevant consideration.

Newton may have believed that the SCE was a logical truth. He may have rejected the very coherence of existing objects which were unextended. Now there is a sense in which this is not really an argument. But it is worth noting that early modern philosophers (not entirely unlike some of their modern-day counterparts) placed an extremely high level of emphasis on the *conceivability* of various metaphysical views. And often it is considerations about conceivability which form the linchpin of their arguments.[50] At the very least Newton is correct to point out that human beings struggle to

[47] And one can trace the roots of this view back even further. Francesco Patrizi (1529–1597) held a similar view: 'For all things, whether corporeal or incorporeal, if they are not somewhere, are nowhere; and if they are nowhere they do not even exist'. Francesco Patrizi, 'On Physical Space, Translated by Benjamin Brickman', *Journal of the History of Ideas* **4** (1943), 225. Or slightly later, at page 226: 'All things (*entia*), therefore, and whatever stands above things, are in Space and cannot but be in Space'. And the view shows up in Charleton. See Charleton, *Physiologia*, 66: '…no substance can be conceived existent without Place and Time'. Going forward, it seems Clarke also formulated a version of the SCE: 'the supposal of the existence of anything whatever includes necessarily a presupposition of the existence of space and time'. Clarke, *Demonstration*, 99.

[48] Henry More, *The Immortality of the Soul*, (ed.) Alexander Jacob (Boston: Kluwer Academic, 1987), 7.

[49] See J.E. McGuire and Martin Tamny, *Certain Philosophical Questions: Newton's Trinity Notebook* (New York: Cambridge University Press, 1983).

[50] One could easily provide examples of arguments from Descartes, Malebranche, Locke, Berkeley, and Hume which have conceivability playing a central role.

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conceptualize non-spatial entities.[51] Were it not the case that Newton's position on this issue runs contrary to positions held by Descartes and Leibniz we might be more susceptible to his intuitions.[52]

The second interesting question about the SCE is whether space itself meets the SCE. I argued in Section 2 that Newton believed that space was a really existing being. And above I insisted that the scope of the SCE was universal. Given this, space should exist in space. Newton clearly believes that space exists in time and that time exists in space.[53] The question of whether space exists in space, or is located in space, however, is slightly more complicated. Nevertheless, the view that space is in space does seem to be Newton's position. Consider a passage cited above: 'Although space may be empty of body, nevertheless it is not in itself a void; and something is there, because spaces are there…'[54] This passage suggests that *spaces* are in space.[55] But as Newton discusses elsewhere, space is not really divisible into separate entities. Spaces are just different ways of delineating infinite space in our thought; considering a defined space is just one way of considering space as a whole. So space exists in itself; it provides the place of its own existence. And this means that space does pass muster according to the SCE. Of course, understanding that space is present in itself, that is to say, in space, is a bit confusing. But perhaps this is what we should expect given that 'any being has a manner proper to itself of being present in spaces.'[56]

[51] Thus, I think there is a sense in which it is safe to say that Newton anticipates the Kantian insight of the Aesthetic.

[52] And even an interpretation of Cartesian spirits which has them as outside of space is not without significant difficulties. See Jasper Reid, 'The Spatial Presence of Spirits Among the Cartesians', *Journal of the History of Philosophy* **46** (2008), 91–117.

[53] Newton, *NPW*, 97: 'Since each and every particle of space is *always*, and each and every indivisible moment of duration is *everywhere*…'

[54] Newton, *NPW*, 27.

[55] And this view is suggested elsewhere in Newton's writings. In the *Principia*'s Scholium on space and time Newton writes as follows: 'Let the parts of space move from their places, and they will move (so to speak) from themselves. For times and spaces are, as it were, the places of themselves and of all things … It is of the essence of spaces to be places, and for primary places to move is absurd'. Newton, *NPW*, 66. A similar, though more detailed, argument occurs in *De Gravitatione* at Newton, *NPW*, 25.

[56] Newton, *NPW*, 26.

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4.1 An Alternative Reading of the SCE

Before moving on I want to consider a different interpretation of the SCE. Rather than suggesting, as I have done above, that the SCE is a metaphysical principle one might suggest that it is a conceptual observation. Put differently, one might argue that in putting forward the SCE Newton just intends to tell us what we mean by the word 'existence' or what we intend to claim when we say that any thing exists. Janiak has offered this sort of interpretation.[57]

Depending on how this interpretation is understood it could be compatible with the one I have offered above or it could motivate against it. I'll consider these two possibilities in order. The understanding of the SCE as a conceptual or linguistic thesis might be amenable to the metaphysical reading I have offered above if we understand conceptual or linguistic claims as having metaphysical implications. Traditional formulations of the ontological argument for God's existence offer a clear case study in the way this works. One begins with conceptual truths or by explaining what is meant when people use the term 'God' and one ends up recognizing that these conceptual truths or linguistic expressions carry metaphysical weight. Specifically, one ends up committed to a metaphysical thesis.

So if we understand Janiak's interpretation of the SCE along these lines then it will be fully compatible with the metaphysical claim that I am interested in. Newton has offered us an analysis of the concept of existence or of what we mean to assert when we say that a thing exists. Specifically, Newton has it that when we say that something exists we mean that it is located in space. Given this, we can then learn that Newton believed space to be a necessary condition for the existence of anything. We can move from Newton's analysis of the concept or word 'existence' to a metaphysical principle which he embraced.

But there is another way of understanding the position that the SCE is only intended to tell us what we mean by the word 'exist.'[58] On this interpretation, what it is for us to say that something exists floats free of the actual metaphysics of space and other objects. So on this view it is true that whenever we claim that an object exists we also claim that that object exists in space, but our claiming this has no bearing on the relationship (of logical, metaphysical, or causal priority) that holds between space and the object. So on this view it is a (contingent) fact that we can only conceive of existing

[57] Janiak, *Newton as Philosopher*, 148–149.

[58] Thanks to Matt Priselac for helping me to better understand this alternative possibility.

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objects as existing in space but this gives us no reason to think that the direction-of-fit (so to speak) between space and objects is one way rather than another. So this way of understanding the SCE is *neutral* with regard to the logic and metaphysics of existence claims; if anything, the SCE tells us facts about ourselves, what *we* mean when *we* say that to exist something must exist in space.

I believe that we can safely reject this understanding of the SCE. This interpretation simply does not seem to fit with the textual passages in which Newton discusses the SCE. One passage claims that without time and space 'nothing whatsoever can exist' and the other claims that 'no being exists or can exist which is not related to space in some way'. Both of these are straightforward declarative sentences. Neither is accompanied by a clarificatory remark which suggests that Newton is merely explaining the limits of our concepts or our linguistic practices ('it seems that…', 'by space I understand…', 'by space is meant…').[59] Given the extraordinary amount of time Newton spent thinking about space, the seriousness with which he took the topic, and his general realist attitude, I think we can treat the SCE as a metaphysical principle.

5. The Problem for Newton

Now that we are armed with a certain understanding of space and certain views about what it is to exist we are ready to understand the theological problem that Newton faces. The problem is that God depends on or requires space to exist.

To make the force of the problem clear it will be worthwhile to spend a few moments sketching out the core Christian tenet which is threatened by Newton's other commitments. Christian theology awards God an extremely high level of independence. God is causally and explanatorily self-contained. God is not caused by anything, does not depend on anything, and does not require anything. The *reasons for* or *grounds of* God's existence are supposed to lie within God's self.

[59] Newton, in general, has no qualms about using such modifiers. Here is a sampling, all from Newton, *NPW*: 22 'parts whose common boundaries we usually call surfaces'; 31–32 'some unintelligible reality that they call substance'; 32 'it is only verbally that we call bodies created and dependent'; 8 'and make that substance we call vapour'; 5 'exhalations, which we call the atmosphere'; 59 'Furthermore, I mean this quantity whenever I use the term "body" or "mass" in the following pages'.

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They are not meant to invoke anything external to God. It is precisely this Christian belief which is threatened by Newton's absolute space.

Leibniz, for one, did not let this threat go unnoticed.[60] Here is his concise formulation: 'Space is not the place of all things, for it is not the place of God. Otherwise there would be a thing coeternal with God and independent of him; *no, he himself would depend on it, if he has need of place*.'[61] Of course, the mere existence of something uncreated and co-eternal with God is not an ideal position to have held in the 17th century.[62] Declaring that God depends on something for His existence or is not independent, however, is seriously problematic.

Let's review how the problem arises for Newton. All substances require space in which to exist. God is a substance. Therefore, God requires space in which to exist. But God is not meant to require anything to exist. Or, for a different approach: God exists. In order for anything to exist it must exist in space. So, in order for God to exist God must exist in space. Space must exist in order for anything to exist in space. So space must exist in order for God to exist. So God requires something other than God in order to exist. A slightly different formulation: God is an independent entity. Independent entities can exist without any other entity existing. All entities require space to exist. No entity can exist without space. Therefore God cannot exist without space. Therefore God is not an independent entity. No matter how the problem is formulated, the central tension is clear. Newton is committed to space as a precondition for the existence of all other things and this is incompatible with God's status as independent and self-determining.

Here again it will be useful to return to the views of Newton's contemporaries. The theological problem arises for Newton because he accepts three different positions. Jettisoning any one of these three

[60] The problem was also briefly noted by John Carriero. See John Carriero, 'Newton on Space and Time: Comments on J.E. McGuire' in *Philosophical Perspectives on Newtonian Science*, (eds) Phillip Bricker and R.I.G. Hughes (Cambridge, MA: MIT Press, 1990), 127–128.

[61] 5th Letter, §79. Leibniz and Clarke, *Correspondence*, 55. Emphasis added. See also 5th Letter, §50: Leibniz and Clarke, *Correspondence*, 48.

[62] Berkeley, for example, seemed to think that this problem was well worth avoiding. He wrote in §117 of the *Principles* that his own view allows us to avoid: 'that dangerous *dilemma*, to which several who have employed their thoughts on this subject, imagine themselves reduced, to wit, of thinking either that real space is God, or else that there is something beside God which is eternal, uncreated, infinite, indivisible, immutable'. Berkeley, *Principles*, 146.

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is sufficient to avoid the problem. Observing how other thinkers avoided the problem shows how these three Newtonian commitments help to generate it. The first problematic commitment is the claim that God must be extended in space. Descartes and Leibniz do not believe that God must be extended; for them God is transcendent and virtually omnipresent rather than immanent and substantially omnipresent.[63] Because of this they do not face this problem. The second problematic commitment is the claim that space is a really existing entity. Barrow and Joseph Raphson do not believe that space is a real entity (only a possibility or potentiality). So even if Barrow and Raphson did believe that God must be extended in space this belief would have no metaphysical consequences. God's need to be extended would be a mere logical constraint. And it is entirely acceptable to claim that God is bound by the laws of logic. The third problematic commitment is the claim that space is ontologically distinct from God. More and Clarke do not believe that space and God are ontologically distinct. So even if they accept the first two problematic commitments they do not hold the view that God depends on something external to Himself.

Before moving on I want to consider an objection. The objection has to do with two different ways of considering the material conditional.[64] One way of formulating the SCE might be to employ the material condition: (any object → space). I have been arguing that this means that the existence of space is a necessary precondition for the existence of any other object. But there are two ways of capturing the sense of the material conditional in English. The first is 'if A, then B'. The second is 'A only if B'. As anyone who has ever taught an introductory logic course can tell you, students often recognize a deeply intuitive difference between these two natural language formulations and are reluctant to accept that both can be symbolized with the same formal machinery. And one can certainly understand what it is that motivates the students' discomfort. In the first (if A, then B) it seems as though A is the agent; A is responsible for bringing about B. In the second (A only if B) it seems as though B is the agent. A's existence can only be logically permitted if B also exists.

So the objection goes as follows. In formulating this problem for Newton I have been relying on the intuition at the heart of this second formulation of the material conditional. But it is entirely

[63] Again, see Reid, 'The Spatial Presence of Spirits' for a discussion of the difficulties for this Cartesian position.

[64] I am especially grateful to Matt Priselac for forcing me to clearly think through this objection.

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possible that Newton intended to be relying on the intuition at the heart of the first. So on this view it is not the case that God *relies on* or *depends on* space for His existence. Instead, it is just the case that when God exists, space also exists; God, not space, is in the driver's seat. This position is rather more innocuous.

I believe that this objection rests on a misunderstanding of the problem for Newton. The objection sets the problem up as a question about the material conditional and asks whether space is a mere consequence (as opposed to a precondition) of God's existence. The hope is that if one can show that God is the agent in the situation and that space is a consequence of God's existence then the problem will dissolve. But note that the problem remains for Newton *even if* we allow that space is caused by God. No matter what the causal origin of space, God will still require space in order to exist. Although some of Newton's texts do strongly suggest that space is an effect of God's existence, the ones which show his commitment to the SCE clearly demonstrate that space is required for God's existence. So even if we allow that the first understanding of the material conditional has some relevance, the second one will still apply as well.

6. Two Considerations

Hopefully, it is now clear that Newton's theory of absolute space has theological consequences which would have been unacceptable to many of Newton's contemporaries. My question in this section is whether these consequences would have been unacceptable to Newton. Did Newton himself see the claim that God depended on space for His existence as problematic? One possibility is that Newton just never recognized that his view of space had the theological implication which I have highlighted in this paper. This is a possibility, but I think it is an unlikely one. As manuscript evidence indicates, Newton spent extraordinary amounts of time throughout his career thinking through the issue of absolute space and its connection to God. This, combined with the fact that, even within his own lifetime, his theory came under attack for having theologically unacceptable implications, makes it seem improbable that Newton was not cognizant of the problem I laid out above. So in this section I want to offer two explanations of why Newton may have been untroubled by this consequence of his view.

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6.1 Newton's Polemical Context

Although Newton's position is problematic, Newton might have held that it was less problematic than every other available position. The challenge Newton faced in delineating the relationship between God and space was to show that the connection between the two was close, but not too close. Specifically, it seems to me that Newton was attempting to navigate between the Scylla of a transcendent God and the Charybdis of a pantheistic one. The theological difficulties with these positions were far more serious than those of his own.

The problem with a transcendent God, like Descartes', is that it did not make the connection between God and space close enough. According to Newton, the position failed because it was unable to make sense of God's action in the world. Newton believed that substances could only act where they were substantially present. This meant that God, in order to act in the world, had to be substantially extended throughout space. Any view which failed to make sense of this was theologically unacceptable. The opposite danger was in making the connection between God and space too close. For Newton, God was the *ruler* of the world, not the world itself. Specifically, Newton was keen to deny that God was a 'world-soul'.[65] This view would also have been more theologically problematic than the view which Newton eventually chose.

So Newton's polemical context makes clear that he saw a comparative advantage in the view he actually chose. Although it did face some theological problems, they were less severe than those faced by his opponents.

6.2 What Kind of Theologian Was Newton?

The second relevant consideration has to do with the *type* of theologian Newton was. When confronted with the theological writings of Leibniz or Clarke, the contemporary reader might reject some of the writer's premises, might wonder why certain topics were of such importance to the author, and might smile at some of the antiquated features of the writing and argumentation. Nevertheless, the contemporary reader has little difficulty following the arguments and tracking the major concerns and considerations of the author. When discussing God and the divine nature, Leibniz and Clarke were

[65] See Newton, *NPW*, 90 and 125.

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primarily philosophical theologians. As such, we can expect them to conform to a broad understanding of God as articulated throughout much of the Western philosophical tradition and also to be responsive to strong philosophical arguments in the realm of theology.

With Newton, it seems to me, the case is importantly different. Newton was another kind of theologian entirely. When faced with Newton's voluminous theological writings, the contemporary reader experiences something alien and befuddling. Newton's theological writings come from a decidedly pre-modern piece of his intellect. He has rules for interpreting Scripture but is never above bending them (or departing from them entirely) to serve some exegetical end. He is continually drawn to the Book of Daniel and other mystical portions of the Bible. He takes a lively interest in Kabbalah and various Hermetic traditions. Above all, Newton's religion was historical and Biblical, not philosophical and rational. Consider Newton's obsession with corruptions of Scripture and the heterodox views (like mortalism and anti-trinitarianism) which he held because he thought they were the original teachings of the Bible.

Another way of making this point is to understand that for Newton, unlike for Leibniz and Clarke, theological terms and doctrines are not necessarily metaphysical. Instead, they may be *moral*.[66] Consider the following quote: '[t]he grand occasion of errors in the faith has been the turning of the scriptures from a moral ~~to a~~ (& monarchical to a physical &) metaphysical (~~& physical~~) sense & this has been done cheifly by men bred up in the (metaphysical) theology of the heathn Philosophers…(the Cabbalists & (ye) Schoolmen)'.[67] This is directly relevant. The point of this paper has been to show that space is a threat to God's metaphysical independence and importance. But it is very clear that space is not a threat to God's moral and monarchical independence and importance. This is true both because space is non-causal and because God is extended in all of space. Space's lack of causal power ensures it could never rival or challenge God's power and authority. And it is by being extended in all of space that God is present to all of Creation and is able to exercise His power and dominion.

[66] See Stephen D. Snobelen, '"God of gods, and Lord of lords": The Theology of Isaac Newton's General Scholium to the *Principia*', *Osiris* **16** (2001), 169–208 for a clear exposition of this point. See also the discussion in Martin Tamny, 'Newton, Creation, and Perception', *Isis* **70** (1979), 53–54.

[67] Yahuda MS 15.5, Fol. 97r. Cited in Snobelen, 'God of gods', 183.

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So although it might be disconcerting for many philosophers to see that Newton's views on space entail that God depends on space for His existence, it is far from clear that this would be troubling to Newton. He had no compunctions about adhering to theological positions he found convincing, even if they were unconventional or unpopular.

7. Conclusion

The goal of this paper has been to show that Newton's views on space have the problematic consequence that God is not an independent being. I have argued for this claim in stages. First, I showed that Newton conceived of space as a being that is ontologically distinct from God. Then I showed that Newton thought that space was a necessary prerequisite for the existence of any other beings. From this it follows that God depends on something external to Him, space, in order to exist. I suggested that Newton may not have been bothered by this consequence of his view for two reasons: 1) the view was still superior to those of his competitors and 2) Newton's theology was, in an important sense, immune to rational critique.[68]

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