

ARTICLE

IS DESCARTES A TEMPORAL ATOMIST?

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I. INTRODUCTION

There is an ongoing debate about Descartes's actual position on the composition of time. One side holds that Descartes's so-called 'Second Causal Proof' (SCP)¹ constitutes evidence of Descartes's assumption or commitment to the view that time is ultimately composed of indivisible 'time atoms' – i.e., the doctrine of 'temporal atomism'. This interpretation of Descartes has been dubbed the 'classic thesis' and the 'received view' by Adam and Tannery (1964–74) and Daniel Garber (1987, 1992) respectively.² The other side, the side that rejects the received view of Descartes, holds that SCP is still consistent with the infinite divisibility of time.³ Closely related to this debate is a second debate about whether or not Descartes assumes or is

¹Descartes's formulation of SCP may be found in the 'Third Meditation' (AT 7: 48–52, CSM 2: 33–5). Descartes's other formulations of SCP may be found in *Discourse on the Method* Part 4 (AT 6: 35–6, CSM 1: 129) and Part 5 (AT 6: 45, CSM 1: 133), *Principles* 1 21 (AT 8A: 13, CSM 1: 200), *First Set of Replies* (AT 7: 109–10, CSM 2: 78–9), and *Second Set of Replies* (AT 7: 165, CSM 2: 116). *Oeuvres de Descartes* (1964–74) is usually abbreviated 'AT'. References to this work will be made by volume and page number. For example, pp. 51–2 of Volume 8 will be represented as AT 8: 51–2. Volumes 1 and 2 of *The Philosophical Writings of Descartes* (1985) are standardly abbreviated as 'CSM'. Since Anthony Kenny also helped to edit and translate many of the letters around which Volume 3 (1991) is assembled, I shall abbreviate this volume as 'CSMK'. References to these works will also be made by volume and page number – e.g., CSM 2: 33, CSMK 3: 33.

²Adherents of the received view include: Alquié (1950: 125–8), Belaval (1960: 149), Bergson (1907: 295, 356ff., 370, 373–4), Gilson (1967: 340–2), Gouhier (1978: 135 n 79), Gueroult (1953: Ch. 6; 1984: Ch.6), Kamia (1982), Kemp Smith (1962: 72–4, 131–2; 1966: 202–3, 335), Kenny (1968), Rodis-Lewis (1971: 533 n 23), Vigier (1920), Wahl (1994), Whitrow (1961, 155–6), Williams (1978: 192–3).

³Philosophers who reject the received view include Arthur (1988), Bennett (2001: 98), Beyssade (1979: vii, 16–17, 129–42, 346–50, 353), Frankfurt (1991: 7, 14–15), Laporte (1950: 158–60). Garber (1987: 571–2) rejects the received view but argues later (1992: 269 ff.) that we have 'no strong reason for attributing either view to Descartes (270). Secada (1990) advocates a similar view.

committed to occasionalism.⁴ Descartes's assuming temporal atomism commits him to a particular version of occasionalism. But it should be understood that the latter interpretation (the view that Descartes is committed to occasionalism) does not necessarily depend on the former interpretation (the received view that Descartes is a temporal atomist). He might be an occasionalist even if he is *not* a temporal atomist.

In this paper, I shall provide an argument for the received view that has not yet been proposed in the literature. I shall argue that we have good reason to believe that Descartes subscribes to the strongest version of temporal atomism – i.e., the doctrine of 'strong discontinuity'. The reader should understand, however, that I myself am not endorsing strong discontinuity. On the contrary, as I shall suggest, I find it to be implausible and ultimately incoherent. But some philosophers do not see this incoherence. Instead, they become susceptible to one or another version of temporal atomism when they treat time as though it were a piece of string that can be cut into separated parts and then mistakenly take this model to be an accurate representation of time. Descartes, I shall argue, is just one such philosopher. He may be brilliant. But he is not infallible.

Of course, a skeptic may argue that if Descartes is indeed brilliant, he could not have made such a glaring mistake in the first place. But while I concede the plausibility of this response, I do not think that it should be accepted out of hand. At best, it raises the burden of proof against my interpretation of Descartes. It should not be thought to rule out my interpretation for three reasons. First, if the skeptic were correct that such a smart philosopher could not have adopted such a silly theory, then it would be equally silly for historians of philosophy to attribute this theory to him. Yet several have (see footnote 2). And we have no reason to believe that they are not very smart themselves. Second, philosophers throughout history have adopted different versions of temporal atomism.⁵ And, again, we have no reason to believe that they too were not very smart. Third, smart philosophers *may* adopt silly theories in certain

⁴See, e.g., Gabbey (1980), Garber (1987, 1992), Gueroult (1953: esp. 276–8, 281–2; 1980; 1984: esp. 196–7, 199–200), Hatfield (1979), Kemp Smith (1962: 73–4, 132; 1966: 201–2, 335), Pessin (2000), Scott (2000).

⁵See, e.g., James (1968: 172, 184–7; 1977: 103–4), Whitehead (1925: 125–7, 135–6; 1978: 35–6, 61–2, 68–9, 286). Barnes (1982: 265) attributes temporal atomism to Sterling of Lampsacus. Sorabji (1983: 326–7, chs. 24, 25) attributes temporal atomism to D. Hilbert and P. Bernays, Bergson, Paul Weiss, early Greek thinkers Diodorus Cronus (died 284 BC) and Epicurus (341–279 BC), and Islamic thinkers such as Abū l-Hudhayl al-'Allāf (died AD 841). Turetzky (1998: 34–7) attributes temporal atomism to the Epicureans, to 'some Islamic thinkers of the ninth and fourteenth centuries (notably the Mutakallimun and al-Ghazali)', and to fourteenth-century Europeans Joannes Canonicus and Nicholas Bonet. Whitrow (1961: 30 n 1, 154–5) attributes temporal atomism to 'ancient atomists, notably the Epicureans such as Lucretius and to various medieval scholars such as Maimonides, the Sautrānkītas, Isidore of Seville, the Venerable Bede, Martianus Capella, and Bartholomew.

circumstances – namely, when it suits their needs and they have not fully worked out, perhaps do not *wish* to work out, its implications. In this particular situation, my sense is that Descartes sees strong discontinuity as lending convenient support to SCP, becomes invested in strong discontinuity as a result, squirms a bit when challenged on it, and all the while wilfully refuses to explore it more fully – perhaps out of a nagging fear that he would come to the same conclusion that we have. Of course, this is speculation on my part. I cannot possibly hope to prove what was going on in Descartes's soul. But given all that I shall say in support of attributing strong discontinuity to Descartes, I think that it stands to reason. After all, it is not so uncommon for philosophers to find their arguments unwittingly committing them to positions that they would otherwise, independently of these commitments, have gladly rejected out of hand.

One last caveat. I will put forward my interpretation of Descartes as *the correct* interpretation. I will defend my interpretation with arguments, and I will anticipate and respond to what I take to be the strongest arguments against this interpretation. Naturally, my goal is to convince the reader that my interpretation is correct and alternative interpretations incorrect. But I hardly think that my goal will be satisfied for every reader. Some, I am sure, will conclude that my arguments succeed at best in proving only that this interpretation of Descartes is *possible*, not necessarily that it is correct or the only reasonable alternative. Still, I will be satisfied enough with this result (especially given that the skeptic above claims that it is *not* possible). I hardly hope to show that there is no room left for counterargument and competing theories. Indeed, I recognize – as should every other historian of philosophy worth her salt – that at the end of the day, there is still a gap between all of the arguments that we may make and the position that we finally adopt. History of philosophy is simply too complicated and organic to allow for proofs that categorically refute the opposition. So, unless we can afford the luxury (and monotony) of suspending our beliefs in philosophical matters, we have to make a leap of faith one way or another. The trick, then, is *not* to make a leap of faith unnecessary. The trick is, rather, to make a leap of faith as small as possible. That is what I try to do – and all I try to do – in this paper. I ask the reader to leap with me, and I take great efforts to assure her that the leap is quite small. But, in the end, there is no avoiding it. Leap she must.

II. THE COMPOSITION OF TIME

It will be helpful to start with a discussion of the composition of time. I shall discuss the only two variables that will play a role in my discussion of SCP. They are: (a) whether time is ultimately indivisible or infinitely divisible and (b) whether time is continuous or discontinuous.

A

Temporal atomism is the view that there is a metaphysically smallest, indivisible part or unit or component of time – the time atom. One second can be broken down into a half-second; a half-second into a quarter-second; a quarter-second into an eighth-second; and so on. But if (say) God were to continue this kind of division, he would eventually reach a minimally short unit of time, a unit that could not in principle be divided any further.⁶

Arguments could go either way about whether or not the time atom is extended – i.e., endures or has duration.⁷ On the one hand, it might be argued that it cannot be extended. For if it were, then it would be at least metaphysically possible⁸ to break it down even further. By this argument, then, the time atom must be ‘instantaneous’ or ‘timeless’ or ‘durationless’.^{9,10}

On the other hand, it might be argued that an extended series cannot be composed of ultimately non-extended parts. That is, no matter how many non-extended time atoms we put together, the end result will still be no

⁶Using the phrase *in principle* here can be a bit dangerous. For, as I shall point out in my Reply to Objection 2 in section VI below, Descartes’s God can do anything and everything, not only what is inconceivable for us but even what is logically impossible. So if the standard by which we gauge whether or not there is a shortest unit of time that cannot in principle be divided any further is God, then the answer is obvious: there is not and cannot be any such thing. But this answer is far too simple. As I hope that my paper will demonstrate, the question of whether or not Descartes is a temporal atomist is much more complicated than such facile treatment of the issue would otherwise suggest. So by *in principle*, I mean here – and shall mean throughout the rest of my paper – within the capacity of a supernatural being who has all of God’s powers except the power to do what is either logically impossible or inconceivable by human minds. The reader should also note that I shall use the expressions *in principle (possible)* and *metaphysically (possible)* interchangeably. So what is metaphysically possible, in my terminology, is also within the capacity of a Cartesian God stripped only of the powers to do what is either logically impossible or humanly inconceivable.

⁷Arthur (1988: 351–2) distinguishes between two kinds of extended-ness: (a) finite or non-infinitesimal, and (b) infinitesimal or ‘infinitely small’ or ‘vanishingly small’. (b), which is really Leibniz’s view, implies that time atoms need not be discrete.

⁸See footnote 6.

⁹Kemp Smith (1966: 202–3) attributes this view to Descartes. See also Kemp Smith (1962: 131–2). Descartes certainly makes this kind of argument with respect to spatial or material atoms. (See Letter to Mersenne (30 September 1640), AT 3: 191–2, CSMK 3: 154; Letter to Mersenne (28 October 1640), AT 3: 213–14, CSMK 3: 155; Letter to Gibieuf (19 January 1642), AT 3: 477–8, CSMK 3: 202–3; Letter to More (5 February 1649), AT 5: 273–4, CSMK 3: 363–4 (cited below in section VI, Objection 11), ‘On Meteorology’ (AT 6: 238–9), and *Principles* 2 20, 34 (AT 8: 51–2, 59–60, CSM 1: 231–2, 239).) Descartes never makes this same kind of argument with respect to temporal atomism. (I shall make this point (as well as other related points) again in section VI.) So Kemp Smith’s attribution is questionable.

¹⁰Epicureans rejected this argument. They held that time atoms could be both indivisible and have non-zero duration. See Sorabji (1983: 348–9, 371) and Turetzky (1998: 35).

extension. For $0 + 0 + 0 \dots + 0$ is still equal to 0.¹¹ This is the reason why it is generally thought that time cannot be composed of non-extended instants, that instants without duration cannot be considered to be the ultimate components of time.¹²

So whether we say that time atoms are extended or not, we run into problems. For some, this point itself might constitute a convincing argument for the *infinite divisibility* of time.¹³ If time is infinitely divisible, then there is no smallest unit of time. For example, one second can be broken down into a half-second; a half-second into a quarter-second; a quarter-second into an eighth-second; and so on infinitely, without ever reaching a smallest unit that cannot in principle be divided any further. Of course, there may be a smallest unit that we human beings can observe or experience or comprehend. But, metaphysically speaking, any period of time – no matter how short – can in principle be broken down into a smaller period of time. I shall refer to one who subscribes to the view that time is infinitely divisible simply as an ‘infinite divisibilist’.

B

It is important to note that, even if we assume that time is infinitely divisible, it is not meaningless or a misuse of language to speak of a durationless ‘instant’ or

¹¹See Kemp Smith (1962: 131–2). Arthur (1988: 350, 373–5) holds that Descartes does think that it is metaphysically possible for many durationless instants to add up to a duration. The only problem is that we cannot truly grasp or comprehend this notion. For a true grasp of this notion would require us to comprehend infinity. And since our minds are only finite, we simply cannot accomplish such a task. But the textual evidence that Arthur cites in support of this interpretation (Letter to Mersenne (11 October 1638), AT 2: 383, 384; Letter to Clerselier (June/July 1646), AT 4: 445–7, CSMK 3: 290–2) does *not* really seem to support this interpretation. So it is a mystery to me why Arthur subscribes to it. Moreover, Descartes says:

Two indivisible things could only make a single thing divisible into two parts at most; but before saying that they could make up a body, you must know what is meant by the term ‘body’. In fact it means a thing which has length and breadth and extension, and so cannot be composed of indivisible things, since an indivisible thing cannot have any length or breadth or depth.

(Letter to Mersenne (28 October 1640), AT 3: 213–14, CSMK 3: 155)

Descartes, then, clearly rejects the metaphysical possibility of material extension being composed out of indivisible, extensionless points. Why, then, would he *accept* the possibility of a duration’s being composed out of durationless instants?

¹²Aristotle makes this kind of argument, sometimes with respect to extended magnitudes more generally, in *On Indivisible Lines* (970a22–4, 971a22–6) (in Aristotle (1984: 1531–2, 1533)), *Metaphysics* (III, 1001b5–25) (in Aristotle (1984: 1581–2)), *On Generation and Corruption* (I, 316a15–317a17) (in Aristotle (1984: 516–17)). See also Epicurus (1926: 32–3), James (1968: 155, 185–6), Kemp Smith (1962: 131–2). Grünbaum (1955: 165; 1967: 116, 117) attributes this point to P. W. Bridgman, to Paul du Bois-Reymond, and to Zeno. Owen (1957–8: 142, 150) also attributes this point to Zeno.

¹³See, e.g., Aristotle in *Physics* (IV, 220a25–31; V, 232b20–233a21) (in Aristotle (1984: 373, 393)).

'moment'. In this context, these terms do not designate a part of time. They do not designate a time atom, extended or non-extended. Rather, they designate the *limit* of a period of time, the *boundary* between two different periods of time. In this way, they are analogous to points. For points do not constitute parts of lines. Rather, lines are composed only of shorter lines.

This suggestion is actually more difficult than it seems. For it runs into two possible counterarguments, neither of which is obviously wrong. First, if lines are composed of shorter lines, then these shorter lines must themselves be composed of even shorter lines. But if the line is finite, then this kind of reduction cannot go on forever; we must eventually reach a *shortest* possible line. By definition, this shortest line cannot be composed of even shorter lines. So it must either *be* a point or be *composed of* points. Either way, then, a line is ultimately composed of nothing but points. Second, two lines may intersect at a point. Clearly, the point at which they intersect is part of both lines. And since lines are not composed of different things at different locations, it follows that the point at which two lines intersect is representative of what the lines as wholes are ultimately composed of.¹⁴

The first argument runs into a dilemma similar to the one that we have already seen temporal atomism run into. Whether the shortest possible lines are single points or composed of a number of points, either they are extended or they are not. If they are extended, then they can be divided even further, in which case they are not the shortest possible lines in the first place. If they are not extended, then their combination cannot yield any more extension. Either way, the first argument seems to be in trouble.

If my conclusion here is correct, then where did the first argument go wrong? I think that it went wrong in assuming that there is such a thing as a shortest possible line. This assumption is false. Lines are infinitely divisible. However much we divide a given line, the remainder can always be divided into even smaller lines. Of course, at some point, what we are left with will become so small that we will not be able to find any further room to divide it. But that stopping-point is a limitation only on human beings, not in principle. In principle, the very tiny line that we human beings are unable to divide any further could indeed be divided further if we were much smaller – say, the size of an ant or amoeba – and therefore the very tiny line (relative to us now) were much bigger (relative to us after shrinking). Lines, then, are composed of nothing but smaller lines, not non-extended points.¹⁵ But this conclusion does not necessarily mean that non-extended points do not have an important role to play in this discussion. On the contrary, non-extended points are useful heuristics. They represent a mathematical ideal,

¹⁴Both arguments assume, and I shall also assume, that lines are composed of something – either points or shorter lines. But I am told that some scholars such as Thomas White and Kenelm Digby reject this assumption.

¹⁵See Aristotle in *On Indivisible Lines* (969b29 ff.) (in Aristotle (1984: 1531 ff.)), *Physics* (VI, 231a18–231b18) (in Aristotle (1984: 390–1)), *On Generation and Corruption* (I, 316a15–317a17) (in Aristotle (1984: 516–17)).

the asymptotes or limits that increasingly reduced lines approach but never quite reach.

Given this conception of the relation between lines and points, we may now respond to the second argument above. Suppose that line AB intersects with line CD at point E. Then there are two things to be said about E. First, qua part of lines AE, EB, CE, and ED, E is an extremely tiny line segment that could in principle be further divided. Second, qua mathematical boundary between AE and EB on the one hand and CE and ED on the other, E is not part of the different lines but rather an ideal non-extended point that the tiny line segment E-qua-part-of-the-various-lines approaches but never actually reaches. Notice, to say that there is a boundary between two lines is not necessarily to say that the two lines are not connected or continuous. Rather, it is only to say that E constitutes the mathematical limit at which the different lines meet.

C

The reader should understand that, in order to avoid begging any questions, whenever I speak of a 'moment' or 'instant' or designate a particular moment (e.g., 't', 't5'), I mean this language to be neutral between a time atom (temporal atomism) and the mathematical limit or boundary of a part or period of time.

If time is ultimately composed of time atoms, then there are two possible relations that may obtain between any given time atom (A) and the next (B). Either A touches (is adjacent to or contiguous with) its successor B or it does not. Arthur refers to the view that A touches B as discontinuity in the 'weaker sense' and the view that A does not touch B – i.e., the view that there is actually a 'gap' between A and B in which no time atoms exist – as discontinuity in the 'stronger sense' or simply 'gap discontinuity'.¹⁶ In keeping with this terminology, I shall refer to the doctrine that time is discontinuous in the weak sense as 'weak discontinuity'; to the doctrine that time is discontinuous in the strong sense as 'strong discontinuity'; to temporal atomists or 'discontinuists' who believe that time is discontinuous in the weak sense as 'weak discontinuists'; and to discontinuists who believe that time is discontinuous in the strong sense as 'strong discontinuists'.¹⁷

¹⁶Arthur (1988: 351).

¹⁷In Aristotelian terms, weak discontinuity suggests that time atoms are 'in succession', have 'contact', and are 'contiguous' but are not 'continuous'. See *Physics* (V, 226b19–227a33) (in Aristotle (1984: 383)). In *On Indivisible Lines* (971a26–972a5 (in Aristotle (1984: 1533–5)) and *Physics* (VI, 231a18–231b18) (in Aristotle (1984: 390–1)), Aristotle argues that weak discontinuity is impossible. In particular, the proposition that (a) an extended magnitude may be (b) composed of indivisible parts (c) in successive contact with each other constitutes an inconsistent triad.

One might argue that strong discontinuity is incoherent. While it might make sense to speak of a material object as being strongly discontinuous, it does not make sense to speak of time as being strongly discontinuous. For if there is a gap between time atom A and time atom B, then this gap cannot possibly have any duration. Otherwise, it will itself be made out of time atoms. And this assumption is contrary to hypothesis. So it must not have any duration. But then A and B must be contiguous after all, in which case strong discontinuity reduces to weak discontinuity. I confess that I have no answer to this objection. On the contrary, I think that it is correct. Nevertheless, one who accepts the ‘physicalizing’ of time – on which strong discontinuity (not to mention weak discontinuity) clearly relies – and then does not pursue the issue any further may fail to realize that there is this problem with strong discontinuity.¹⁸ As I shall argue below, this is precisely the situation that Descartes is in.

Again, one might argue that even if temporal atomism entails discontinuity (weak or strong), the infinite divisibility of the parts of time does *not* entail that time as a whole is uniformly continuous. For there may very well be a *gap* between one infinitely divisible period of time and another infinitely divisible period of time. On this view, one might imagine ‘segments’ or ‘bars’ of time periodically interrupted by gaps. So while each individual time segment is itself infinitely divisible, the overall line of time is full of gaps and therefore periodically discontinuous in the strong sense.

This point presupposes that time is or may be non-uniform or non-homogeneous. But so far as I know, neither Descartes nor any of the literature on Descartes even mentions this possibility. If my observation is correct, then it seems safe to say that both Descartes and his commentators simply assume that time is homogeneous. They seem to assume, that is, (a) that if time is continuous at any point, it is continuous at *all* points (there are *no* gaps) and (b) that if time is ultimately indivisible, then it exhibits either uniform weak discontinuity (if any time atom touches its successor, then every time atom touches its successor) or uniform strong discontinuity (if there is a temporal gap between any atom and its successor, then there is a temporal gap between *every* time atom and its successor). I shall continue throughout this discussion to assume that time is homogeneous not only because there is no evidence that Descartes and his commentators assume otherwise but also because the opposite assumption would unnecessarily complicate this already complicated enough issue.

I should point out that in my Reply to Objection 5 (in section VI below), I shall concede a different reason (a reason other than the ‘non-uniformity argument’ just above) to believe that infinite divisibility does not entail continuity. Moreover, in my Replies to Objections 3 and 4, I shall argue that continuity for Descartes does not entail infinite divisibility. So continuity

¹⁸By *physicalizing* time, I mean nothing more than what I suggested in the introduction – namely, treating time as though it were a string that can be cut into separated parts.

and infinite divisibility should not be thought to be interchangeable. Rather, while something's being infinitely divisible means that it has no smallest unit, something's being continuous means that there are no gaps, no absences of units, in between the constituent units. And these are simply two different concepts.

III. THE FIRST PART OF DESCARTES'S SECOND CAUSAL PROOF

SCP may be divided into two parts. The first part is designed to prove that there must exist a being that continuously (re-)creates me from one moment to the next. The second part is designed to prove that this being must be God rather than me, my parents, or some other finite being or collection of finite beings. In this paper, I shall not be concerned with the second part of SCP. I shall be concerned only with the first part of SCP (henceforth, FPSCP).

A

Here is how Descartes formulates FPSCP in the 'Third Meditation':

[A] lifespan can be divided into countless parts, each completely independent of the others, so that it does not follow from the fact that I existed a little while ago that I must exist now, unless there is some cause which as it were creates me afresh at this moment – that is, which preserves me.¹⁹

(AT 7: 48–9, CSM 2: 33)

Given this passage, Descartes's argument seems to be:

1. The period of time for which I exist is divisible into a great many parts.
2. These parts are independent of each other.
3. ∴ The fact that I exist at time t does not necessarily mean that I will exist at a following time $t + 1$.²⁰
4. ∴ If I am to exist at $t + 1$, something must cause me to exist at $t + 1$.
5. ∴ If I am to exist for a period of time, I must be continuously (re-)created at each moment of the period.

¹⁹See also AT 3: 429, CSMK 3: 193; AT 6: 36, 45, CSM 1: 129, 133; AT 7: 49, 9: 39, CSM 2: 33; AT 7: 109–10, CSM 2: 79; AT 7: 369–70, CSM 2: 254–5.

²⁰Descartes does not explicitly use the language of necessity or necessitation here. But 'follow from' suggests that Descartes has in mind at least conceptual or logical entailment, which is clearly a form of necessity/necessitation.

Incidentally, Descartes most likely borrowed this argument from others. At least three predecessors had made virtually the same argument prior to publication of *The Meditations* in 1641.²¹ Descartes's only real innovation was to derive (3) from (1) and (2) rather than simply to assume it.²²

B

I shall now argue that there are a number of different problems with FPSCP thus formulated. I do so in order to clarify some of the relevant issues and to elicit three explanatory questions that will form a central part of my argument for the received view in section V.

First, (3) is ambiguous between the following two interpretations:

(3a) My existing at t may be able on its own to cause me to exist at $t + 1$. But it cannot *guarantee* or *necessitate* it. For if something else, something more powerful, interferes with this cause, then I will cease to exist at $t + 1$.²³

(3b) My existing at t cannot on its own cause, no less necessitate, me to exist at $t + 1$. The cause of my existing at $t + 1$ cannot be my existing at t .

Descartes is usually interpreted as having (3b) in mind. And given the final conclusion toward which Descartes is heading – namely, that God must exist – (3b) seems right. For if an earlier part of my existence could *on its own* cause me to exist as long as nothing else interfered, then there would be no need for God.²⁴ I could continue to exist without him, at least until something interfered. But Descartes explicitly denies this possibility. So the first explanatory question raised by FPSCP is: why does Descartes think that an earlier part of my existence cannot cause – no less necessitate – a later part of my existence? Why are the earlier parts of my existence 'causally impotent' with respect to the later parts of my existence?

²¹See St. Thomas Aquinas (*Summa Theologica* I, Question 104, First Article), Jean de Silhon (*The Two Truths*, 'Ninth Discourse'), and Jean-Baptiste Morin (*That God Exists*, Theorems 22–4). It is well-established that Descartes had ample exposure to works both by and about Aquinas. See, for example, Ariew (1999: 9, 13, 39–40). And regarding Silhon and Morin, *The Two Truths* was published in 1626 and *That God Exists* in 1635. The excerpts cited just above from both of the latter works may be found in Ariew, Cottingham, and Sorell (1998: 185–6 and 244–5 respectively).

²²See Bennett (2001: 96).

²³Gassendi endorses (3a) in the *Fifth Set of Objections* (AT 7: 301–2, CSM 2: 210).

²⁴Because I do not have the space to examine the second part of SCP in this paper, I shall simply assume that it would be correct if FPSCP were correct. In other words, I shall assume that if Descartes successfully proved the existence of a continuously (re-)creating being in FPSCP, then he would also be correct that this continuously (re-)creating being is God. So for the sake of convenience, I shall continue to refer to this continuously (re-)creating being simply as 'God'.

C

Second, (2) is not necessary for (3). I take the point of (2) to be that no earlier part of time *logically* guarantees that there will be a later part of time. So it is logically possible that time will end; that there will be a last moment; that after any moment t , there will not necessarily be a moment $t + 1$. Now, this conclusion certainly *entails* (3). If it is logically possible that time end at any given moment t , then it is certainly logically possible that I – who exist in time – cease to exist at t . But it is not clear that (3) really *depends* on (2). For given (1), (3) would be true even if (2) were false. Even if every earlier part of time logically guaranteed that there be a later part of time, even if it were (therefore) logically *impossible* that time end, it would *still* be the case that I could cease to exist at any moment. Time's immortality would hardly guarantee my immortality. So the fact that my ceasing to exist is logically possible does not necessarily depend on whether or not it is logically possible for time to end. (3), then, requires only (1). It does not require (2).

The argument above presupposes that Descartes is talking about time 'in the abstract'. But one might object that this may not be Descartes's main concern here. Rather, his main concern may be with the duration of minds and objects. If so, then (2) and (3) should be interpreted differently. Instead of interpreting '[t]hese parts' to mean parts of time in the abstract, it should be interpreted to mean parts of my life. On this interpretation, it turns out that (3) *presupposes* (2). The notion that my existing at one time does not entail my existing at a later time itself presupposes that my existence can be separated into at least two parts, an earlier and a later. So on this interpretation, (3) *does* require (2).

I think that this argument is compelling. But it still cannot be the whole – or even most of – the story. Descartes cannot be interpreted as being *solely* concerned with the duration of objects and not at all concerned with time in the abstract. I shall support this point further in my reply to Objection 6 (in section VI) below.

D

Third, (4) is ambiguous between two different interpretations:

- (4a) If I am to exist at $t + 1$, something must *at* $t + 1$ cause me to exist at $t + 1$.
- (4b) If I am to exist at $t + 1$, something must *at some time or another* cause me to exist at $t + 1$.

There are two main differences between (4a) and (4b). First, while (4a) assumes that God is in time, (4b) is neutral on this issue. Second, (4a)

implies that for every moment that I exist, God must perform a distinct act of preservation. So if I exist for a total of z moments, then God must perform z acts of preservation. His will is 'multiple'. (4b), however, does not necessarily imply this point. Instead, (4b) implies that God might need to perform as few as one act of preservation. For example, he might stipulate either at or before t , 'Let [me] exist from time t to time $t+z$ '. And this stipulation would explain why I continue to exist from t to $t+z$. His stipulative act in a sense sustains me from one moment to the next. In this case, God's will is 'single'.

It is not entirely clear which version of (4) Descartes has in mind. As we have seen above, Descartes says that God must 'as it were create me afresh at this moment' ('Third Meditation', AT 7: 49, CSM 2: 33). The notion that I am 'created afresh' at this moment implies that this moment of my existence requires a distinct act of creation on God's part. And this implication would seem to suggest that Descartes is arguing for (4a) rather than (4b). This conclusion is further supported by Descartes's reference to the 'continual action of the original cause' (*Fifth Set of Replies* (AT 7: 369, CSM 2: 254)). Descartes's claim that God 'must always continue to act on the effect in the same way in order to keep it in existence' (*Fifth Set of Replies* (AT 7: 369, CSM 2: 255)); and Descartes's claim that God 'always preserves the motion in the precise form in which it is occurring at the very moment when he preserves it, without taking any account of the motion which was occurring a little while earlier' (*Principles* 2 39 (AT 8A: 63–4, CSM 1: 242)).

On the other hand, the 'as it were'²⁵ suggests that Descartes's argument is merely an analogy and therefore that it should not be interpreted literally.²⁶ In this case, Descartes might have (4b) in mind. This conclusion would be further supported by two comments Descartes makes, one in *Principles* 1 23, the other in a letter to Frans Burman (16 April 1648) explicating this passage from *Principles*. I shall quote both of these passages in the same order:

[E]ven [God's] understanding and willing does [*sic*] not happen, as in our case, by means of operations that are in a certain sense distinct from one another; we must rather suppose that there is always a single identical and perfectly simple act by means of which he simultaneously understands, wills and accomplishes everything. When I say 'everything' I mean all *things*; for God does not will the evil of sin, which is not a thing.

(AT 8A: 14, CSM 1: 201)

²⁵See also *First Set of Replies* (AT 7: 109, CSM 2: 79), *Principles* 1 21 (AT 8A: 13, CSM 1: 200).

²⁶Arthur (1988: 355) makes, and Frankfurt (1991: 15) seems to make, this point as well.

We cannot conceive of how this [single identical and perfectly simple act by means of which God simultaneously understands, wills and accomplishes everything] happens, only understand it. Any different conception we may have arises from the fact that we think of God as a man who accomplishes all things as we would – by means of many different acts. If, however, we pay careful attention to the nature of God, we shall see that we can only understand him as accomplishing all things by means of a single act.

(AT 5: 165, CSMK 3: 347)

One may argue that Descartes in these passages is referring to any given thing, not every thing. In other words, Descartes is not necessarily suggesting that God has performed only one act of understanding and willing, from which everything that has ever existed or happened, exists or happens now, and will exist or happen has arisen, is arising, or will arise. Rather, he is suggesting only that for any given thing that exists or happens, God's willing that thing to exist or happen is identical with his understanding that thing to exist or happen. This latter conception still leaves open the possibility that the existence or happening of something else involves yet a *different* act of willing and understanding on God's part. So if each part of my continued existence is regarded as distinct from – *something other* than – the previous part of my existence, then each part of my existence may require yet a distinct act on God's part, a distinct act of willing-and-understanding. Naturally, such an interpretation would point back to (4a).

But, first, this interpretation is incompatible with what Descartes says in Part Five of *Discourse on the Method*: 'But it is certain, and it is an opinion commonly accepted among theologians, that the act by which God now preserves [the world] is just the same as that by which he created it' (AT 6: 45, CSM 1: 133). Second, even if this interpretation of Descartes were correct, (4b) would still remain a viable interpretation of (4). Nothing about this interpretation rules out the possibility that I or my continued existence is one 'thing'. And if I or my continued existence is itself taken to be one 'thing', then it follows that it requires only one distinct act of willing-and-understanding on God's part.

E

My fourth point regarding FPSCP is that, whichever interpretation of (4) we accept, it does not follow from the premises. Given premises (1) to (3), it still seems perfectly possible to hold that my continued existence does not need a cause. Indeed, one might very well argue: just because my earlier existence does not cause or necessitate my later existence does not mean that my later existence must be caused. I could just 'happen' to continue existing through $t + 1$ until something 'gets in my way'. Put

another way, my continued existence needs only a ‘negative cause’ – i.e., the absence of factors that will interfere with my existence. It does not need a ‘positive cause’ – i.e., the presence of factors that will actively ‘breathe’ or ‘pump’ existence into me rather than merely keeping existence from being ‘sucked’ out of me.²⁷

Descartes, however, seems to think that not merely a negative cause but also a positive cause is necessary for my continued existence. In the *Fifth Set of Replies*, in response to an objection by Gassendi, Descartes suggests that it is *self-evident* that continued existence requires a continuous *positive* cause:

When you deny that in order to be kept in existence we need the continuous action of the original cause, you are disputing something which all metaphysicians affirm as a manifest truth – although the uneducated often fail to think of it because they pay attention only to the causes of coming into being and not the causes of being itself.

(AT 7: 369, CSM 2: 254)

Descartes, then, thinks (a) that it is impossible for something to continue to exist without a continuous positive cause and (b) that (a) is self-evident.

(a) implies the counterfactual proposition: if there were no positive cause of my existing at any given time *t*, then I would not exist at *t*. I would cease to exist as soon as the positive cause of my existence ceased to keep me in existence. I shall refer to this proposition as Descartes’s ‘Counterfactual Assumption’.^{28,29,30} As it turns out, the inference from (3) to (4) is valid only if we insert the Counterfactual Assumption in between them. So the second explanatory question FPSCP raises is: why does Descartes subscribe to the Counterfactual Assumption?

²⁷Gassendi also makes this point in the *Fifth Set of Objections* (AT 7: 300–1, CSM 2: 209–10).

²⁸Descartes explicitly affirms the Counterfactual Assumption in a letter to Hyperaspistes (August 1641): ‘There is no doubt that if God withdrew his concurrence, everything which he has created would immediately go to nothing; because all things were nothing until God created them and lent them his concurrence’ (AT 3: 429, CSMK 3: 193). This passage hints that Descartes’s Counterfactual Assumption actually follows from a key premise in his First Causal Proof – namely, that something cannot come from nothing.

²⁹Frankfurt (1991: 3), Garber (1992: 264), Wahl (1994: 69), and Williams (1978: 149) also recognize that Descartes adopts the Counterfactual Assumption.

³⁰Other advocates of the Counterfactual Assumption include St Thomas Aquinas (*Summa Theologica* I, Question 8, Article I, Question 104, Article I), Jean de Silhon (*The Two Truths*, ‘The Ninth Discourse’; see Ariew, Cottingham, and Sorrell (1998: 186)), and Suárez (*Metaphysical Disputations*; see Secada (2000: 171)). Bennett (2001: 96) points out that, in addition to some of Descartes’s predecessors, some of his successors – namely, Locke and Leibniz – also adopted the Counterfactual Assumption.

F

Finally, (5) does not follow from (4). It seems that even if we accept (4), even if we accept the premise that my continuing to exist requires a cause, (4) does not specify the *nature* of this cause. It does not tell us why this cause might not take the form of a continuous ‘carrying’ or ‘delivering’ over from one moment to the next. On this view, if I am to exist at the next moment, God must simply ‘carry’ or ‘deliver’ me over from the last moment as I might carry a fragile bubble from one place to another. While I do not create the bubble at each moment, I do ‘keep it alive’; were I to remove my hand from underneath (let’s say), the bubble would burst. Descartes simply assumes here (and elsewhere) that the cause of my continuing to be must take another form, that it requires something more (or other) than continuous delivery – namely, continuous (*re-*)creation.³¹

For example, in the ‘Third Meditation’, Descartes says:

[I]t is quite clear to anyone who attentively considers the nature of time that the same power and action are needed to preserve anything at each individual moment of its duration as would be required to create that thing anew if it were not yet in existence. Hence the distinction between preservation and creation is only a conceptual one, and this is one of the things that are evident by the natural light.

(AT 7: 49, CSM 2: 33)

And in the *Fifth Set of Replies*, Descartes replies to Gassendi as follows:

You say that we have a power which is sufficient to ensure that we shall continue to exist unless some destructive cause intervenes. But here you do not realize that you are attributing to a created thing the perfection of a creator, if the created thing is able to continue in existence independently of anything else.^{32,33}

(AT 7: 370, CSM 2: 255)

³¹Bennett (2001: 96) refers to this assumption as Descartes’s ‘non-endurance doctrine’.

³²See also *First Set of Replies* (AT 7: 109–10, CSM 2: 78–9), *Second Set of Replies* (AT 7: 165, CSM 2: 116), *Fourth Set of Replies* (AT 7: 243, CSM 2: 169), *Principles* 1 21 (AT 8A: 13, CSM 1: 200), *Principles* 2 61 (AT 8A: 61, CSM 1: 240); and the sources that I cite in footnote 19. I should point out that Descartes does not always use the language of creation. He sometimes also uses the language of concurrence. See Letter to Hyperaspistes (August 1641) (AT 3: 429, CSMK 3: 193), *Discourse on the Method* Part Five (AT 6: 45, CSM 1: 133), *Principles* 2 36 (AT 8: 61, CSM 1: 240). I believe that these passages are more consonant with the notion of continuous delivery than with the notion of continuous (*re-*)creation. But whether or not this is the case, we certainly cannot ignore the passages listed above in which Descartes uses the language of continuous (*re-*)creation.

³³Bennett (2001: 98) points out that this argument presupposes that my existence at an earlier time and my existence at a later time are ‘distinct things, distinct realities’.

Descartes's argument in the latter passage is that the power or property of continuing to exist without a cause cannot be attributed to created things, only to their creator. And the second sentence suggests that the reason underlying this conclusion is that the power to continue existing without a cause is equivalent to a power that I do not have – namely, the power to (re-)create myself at every moment.

So one question FPSCP raises is: why does Descartes assume that my preservation, causing me to continue existing at each consecutive $t + 1$, entails my being (re-)created at $t + 1$ rather than simply my being delivered over from t to $t + 1$? One might argue that, for Descartes, this question presupposes something false. It presupposes that there is a distinction between continuous delivering and continuous (re-)creation when, for Descartes, there really *is* no such distinction. That is, contrary to what the question above assumes, Descartes would say that continuous (re-)creation does not involve anything more than continuous delivering. For, as we have seen, Descartes explicitly says that continuous (re-)creation and preservation are conceptually identical; that they are one and the same thing under two different descriptions. So if continuous delivering would preserve me, then by transitivity it must be identical with continuous (re-)creation. They too are one and the same thing under two different descriptions.³⁴

Clearly, in my bubble analogy above, there is a distinction between getting a bubble from place P1 to place P2 by carrying it to P2 and getting the bubble from P1 to P2 by destroying it at P1 and re-creating it at P2. It is the distinction between a transition without (re-)creation and a transition by means of (re-)creation. The spatial then translates easily to the temporal. In temporal terms, the distinction is between a temporal transition from moment M1 to moment M2 without (re-)creation at M2 and a transition from M1 to M2 by means of (re-)creation at M2. Continuous delivering, then, seems to accomplish what continuous (re-)creation does *without* the (re-)creation. For this reason, it seems as though continuous (re-)creation and continuous delivering constitute not one and the same but rather two different – metaphysically different – means to the same end (i.e., my preservation or continued existence).³⁵

Still, the most that this argument helps to show is that Descartes's assumption that preservation and continuous (re-)creation seems false, that the relationship between the latter and the former seems not to be identity but rather means-end. It does *not* help to show that Descartes does not make this seemingly false assumption in the first place. And given that Descartes does indeed make this seemingly false assumption, it follows that the argument two paragraphs above is correct. This assumption (in conjunction with the assumption that continuous delivering would preserve me) entails that Descartes does not distinguish between continuous

³⁴See Bennett (2001: 96).

³⁵See Bennett (2001: 96).

delivering and continuous (re-)creation. Therefore the third explanatory question is: why does Descartes subscribe to this seemingly false assumption – i.e., why does he identify continuous (re-)creation and preservation – in the first place?

IV. FOUR FAILED ARGUMENTS FOR THE RECEIVED VIEW

Again, the three main explanatory questions FPSCP raises are as follows. First, why does Descartes think that no earlier part of my existence can cause (no less necessitate) any later part of my existence? Second, why does Descartes subscribe to the Counterfactual Assumption? Third, why does Descartes identify continuous (re-)creation and preservation? In section V, I shall attempt to answer these three explanatory questions. I shall argue that the best answer to these questions is that Descartes is assuming not merely temporal atomism but strong discontinuity in FPSCP. It is important to note that my argument will be that he is *assuming* strong discontinuity, *not* that he is *committed* to strong discontinuity. But before providing my own answer to these explanatory questions in section V, I shall first offer what I take to be four of the strongest arguments for the received view – again, the view that Descartes assumes/is committed to temporal atomism.³⁶ In the end, I shall reject them all.

A

First, Descartes speaks in several places of ‘instants’.³⁷ This language suggests that he thinks time is composed of indivisible time atoms. The problem with this argument, however, is that Descartes can speak of instants without necessarily committing himself to temporal atomism. Again, Descartes seems to regard an instant as a non-extended, indivisible limit of a given period of time.³⁸ So if indivisibility entailed temporal atomism, then Descartes would be committed to the view that instants are indeed time atoms. But even though indivisibility is an essential property of

³⁶There are others as well. Most of them can be found in Arthur (1988). I will not mention them here because I think that Arthur does a perfectly good job of refuting them.

³⁷See *Principles* 3 63 (AT 8: 115), *Rules for the Direction of the Mind*, Rule 12 (AT 10: 420, CSM 1: 45), and Letter to Mersenne (27 May 1638) (AT 2: 143).

³⁸For example, in *Rules for the Direction of the Mind*, Rule 12 (AT 10: 420, CSM 1: 45), Descartes suggests that we should count among the ‘simple natures’ the ‘corresponding privations and negations’. He then proceeds to include ‘an instant’ in his list of ‘privations and negations’ and follows this point with yet another list which makes it clear that he means an instant to be the privation and/or negation of duration. In short, then, Descartes’s suggestion here is that instants are both simple and privations and/or negations of duration (durationless). And this interpretation lends further support to the view that he takes instants to be non-extended and indivisible.

time atoms, indivisibility does *not* entail temporal atomism. For in order to be a time atom, something more than indivisibility is required: the thing in question must also constitute a part or unit or component of time. We have already seen in subsection II B that this property cannot be ascribed to instants. So if Descartes's talk of 'instants' really does refer to instants rather than to time atoms – and this situation is quite possible – then these references are still perfectly consistent with his subscribing to infinite divisibility rather than to temporal atomism.³⁹

B

The second argument for the received view (that Descartes assumes/is committed to temporal atomism) is that this point directly follows from (1) and (2). To say that the parts of time are independent of each other is just to say that the parts of time are in principle separable from one another. Indeed, Descartes suggests the latter explicitly to Gassendi in the *Fifth Set of Replies*: '[Y]ou would not deny that the individual moments can be separated from those immediately preceding and succeeding them' (AT 7: 370, CSM 2: 255).⁴⁰ And the notion that the parts of time are in principle separable entails that time is ultimately composed of separate, discontinuous parts.⁴¹

But this argument pulls the proverbial rabbit from the hat. Descartes's assumption of in-principle separability is ambiguous between an assumption about the independence of the parts of time and the conclusion of temporal atomism. It can seem equivalent to both. So this middle term can create the

³⁹Secada (1990: 47) makes a similar point. Beyssade (1979: 348–50, 353) offers a similar proposal when he argues that Descartes has in mind a technical distinction between moments and instants. For Descartes, according to Beyssade, moments are vanishingly small but still extended and therefore divisible (in principle) parts of time. Instants, on the other hand, are limits, boundaries, the privation or negation of duration, and therefore non-extended and indivisible. Arthur (1988: 367, 369–70) rejects Beyssade's proposal for two reasons: (a) Descartes sometimes speaks of moments as though they are non-extended and indivisible (Arthur refers to *Principles* 3 111 (AT 8: 159), *First Set of Replies* (AT 7: 111, CSM 2: 80)), and (b) Arthur agrees with Gueroult's argument (1953: 273, 274; 1984, 193, 194) against Laporte that the extendedness of the Cartesian moment contradicts Descartes's analysis of motion as a succession of instantaneous states and Descartes's position that light does not travel but instantaneously fills a space. See also Arthur (1988: 351, 354), Frankfurt (1991, 7), and Garber (1987: 572–3; 1992: 270–2). Secada (1990: 63) regards Descartes's discussion of light's capacity to reach distant points instantaneously as 'irrelevant to the issue under examination'.

⁴⁰See also *First Set of Replies* (AT 7: 109, 110, CSM 2: 78–9), *Second Set of Replies* (AT 7: 165, CSM 2: 116), *Fifth Set of Replies* (AT 7: 369–70, CSM 2: 255), *Principles* 1 21 (AT 8A: 13, CSM 1: 200), Letter to Chanut (6 June 1647) (AT 5: 53, CSMK 3: 320).

⁴¹See Garber (1992: 270–2). Secada (1990) thinks that this is the main argument for the received view.

impression that the temporal atomist conclusion does indeed follow from the independence-of-the-parts-of-time premise. But this impression is false. The issue of whether or not the parts of time are independent of each other is entirely distinct and independent from the issue of whether or not time is ultimately composed of indivisible time atoms.

The issue of whether or not the parts of time are dependent on or independent of one another concerns whether or not (a) earlier parts could exist without later parts and (b) later parts could exist without earlier parts. If both (a) and (b) are the case, then we say that the parts of time are 'mutually' or 'reciprocally' independent. If (a) earlier parts can exist without later parts, then there can in principle be a last moment of time. And if (b) later parts can exist without earlier parts, then there can in principle be a first moment of time. Notice, (a) and (b) involve time 'in the abstract' – i.e., the nature of time independent of any object existing in time. Yet some philosophers prefer to discuss the question of whether or not the parts of time are independent of one another in terms of the parts of time *through which a given object exists*. In this context, the same question can be reformulated in terms of whether or not (c) earlier parts of the object's duration could exist without later parts of the object's duration (i.e., whether or not the object could 'die') and (d) later parts of the object's duration could exist without the earlier parts of the object's duration (i.e., whether or not the object could 'begin').⁴²

Again, contrary to the second argument above for the received view, these questions concern different aspects of time than does the question of temporal atomism. First, whether or not (a) and/or (b) is the case does not determine whether time is ultimately indivisible or infinitely divisible. The last moment referred to in (a) could be either the last time atom or the end limit of time. Likewise, the first moment referred to in (b) may refer either to the first time atom or to the beginning limit of time. Second, the converse is true as well. Whether time is ultimately indivisible or infinitely divisible does not determine whether (a) and/or (b) is the case. Whether time is ultimately indivisible or infinitely divisible, the parts of time may still be either dependent on or independent of each other. So in the end, it may still be the case that the parts of time are independent of one another *and* infinitely divisible as well, in which case temporal atomism does *not* follow from (1) and (2).⁴³

⁴²Gassendi in the *Fifth Set of Objections* (AT 7: 301, CSM 2: 209) emphatically rejects both (a) and (b). For Gassendi, time can neither begin nor end; it must always exist. On the other hand, Gassendi clearly accepts (c). Whether or not he accepts (d), however, I cannot tell.

⁴³See Gassendi in the *Fifth Set of Objections* (AT 7: 301, CSM 2: 209), Garber (1992: 270–2), and Secada (1990: 48). Frankfurt (1991: 11–13) argues that while the issue between (a) and (b) concerns the 'substantive relationships' that may obtain among the elements of a time series, the question of temporal atomism concerns the 'formal characteristics' of this series. Arthur (1988: 354–5, 362–3, 366) takes a similar approach with regard to (c). He agrees that Descartes's suggestion that the parts of my existence are independent does indeed entail that they are in

C

The third argument for the received view is that, according to Descartes, God's creative act – like God's thought – is indivisible. Therefore the time in or at which it occurs cannot be divisible.⁴⁴ But there are two reasons to doubt this argument. First, Arthur offers a compelling response to this (Gueroult's) argument:

Although [God] is creating the world at each instant, just as I am thinking at each instant, the act of creation itself is continuous over time . . . [T]here is only one such act, which although unextended and indivisible with respect to its own nature, is nonetheless extended and divisible with respect to its duration, which is continuous . . . One thought can take place over an extended time without being divisible qua thought.

(1988: 358–60)

For Descartes, then, the fact that God's creative act is indivisible qua act – i.e., with respect to itself or its own nature – does not necessarily imply that it is indivisible qua temporal object – i.e., with respect to its duration.⁴⁵ So it may still be (for Descartes, according to Arthur, it still *is*) infinitely divisible in terms of time. Second, the sense in which God's thought is thought to be indivisible is different from the sense in which time might be thought to be indivisible. Since thought, unlike time, does not have the attribute of extension or duration for Descartes, it does not make any sense to ask whether or not it can be broken down into *smaller* or *shorter* parts. The concepts of indivisibility and parthood are at best *analogously*, not literally, applied to thought. What Descartes really means when he suggests that God's thought is indivisible is that there is no distinction between his will and his intellect. What God thinks and what God wills are one and the same. Clearly, nothing about time follows from *this* proposition – including, of course, the notion that *it* is indivisible.

principle separable, by which he means that I could in principle die or disappear at any moment. But, Arthur argues, this point hardly entails that the parts of my existence are actually discontinuous in either the weak or the strong sense. For the fact that I could die or disappear at any moment does not entail that there are time atoms. Once again, 'moment' here could be referring to a non-extended, indivisible limit – not unit – of time. According to Arthur, then, when Descartes suggests that the parts of my existence are independent of or in principle separable from one another, he means to suggest only that my existence at any moment could in principle end (i.e., is contingent). And this point is perfectly consistent with my temporal existence's being infinitely divisible.

⁴⁴See Gueroult (1953: 274–5, 279–81, 285; 1984: 194–5, 198–9, 202).

⁴⁵Descartes makes this suggestion in a letter to Burman (16 April 1648, AT 5: 148–9, CSMK 3: 335).

D

The fourth argument for the conclusion that Descartes assumes/is committed to temporal atomism is the following *reductio ad absurdum*. Assume that Descartes does not subscribe to temporal atomism but instead holds that time is infinitely divisible. Then there are an infinite number of moments between any two given moments t and $t + 1$. So if I must be continuously (re-)created to get from t to $t + 1$, God must (re-)create me an infinite number of times. But such a feat is impossible. Therefore if my continued existence requires continuous (re-)creation, time must not be continuous or infinitely divisible. And because Descartes thinks that my continued existence requires continuous (re-)creation, it follows that Descartes must subscribe to temporal atomism.

I think, however, that there are four problems with this *reductio*. First, even if it were successful (I shall provide three arguments below that it is not), it would still leave unexplained why Descartes identifies continuous (re-)creation and preservation. For the *reductio* does *not* show that Descartes's belief in temporal atomism motivates him to adopt the doctrine of continuous (re-)creation. Rather, it shows just the reverse: that Descartes's doctrine of continuous (re-)creation commits him to temporal atomism. So it still remains to be seen why he would adopt a doctrine of continuous (re-)creation in the first place.

Second, there is really no good reason to believe that it is impossible for God to create me an infinite number of times. After all, it is God – a supposedly omnipotent being – that we are talking about.

Third, we have already seen that my continued existence may not require a series of creative acts on God's part. Again, if Descartes has (4b) in mind, it may require only *one* such creative act. God may cause me to continue to exist simply by stipulating that I shall exist from time t to time $t + z$. In this case, *even if* time is infinitely divisible, God need not (re-)create me an infinite number of times to get me from one moment to the next.

Fourth, the *reductio* above is similar to one version of Zeno's Paradox, the 'Paradox of the Half-Distances' ('PHD').⁴⁶ PHD argues in spatial terms what the *reductio* above argues in temporal terms. Given (a) that an infinite number of subintervals exists between any two points A and B and (b) that an infinite number of subintervals cannot be 'traversed' (i.e., that nothing can reach the end of an endless series), it follows that nothing can move from A to B. And because A and B represent any two spatially distinct locations, it follows that there cannot be any motion. Now, this conclusion is clearly false. For there clearly *is* motion. And whatever exists is clearly possible. So there must be something wrong with this argument. Put another way, PHD raises not so much an ontological problem as an

⁴⁶Sorabji (1983).

explanatory problem: how can there be motion given that it seems to require what is mathematically impossible – namely, that an infinite series be traversed?

One candidate for what is wrong with PHD, the candidate that is most analogous to the conclusion of the *reductio* above, is that space, and therefore the distance or extension between any two points, is *not* infinitely divisible. But, first, this proposal is by no means the only possible solution to the explanatory problem raised by PHD. Other (plausible) solutions have been proposed.⁴⁷ Second, it is actually rather implausible. Indeed, we have already seen good reason in subsection II B to think that lines are infinitely divisible. And because lines are spatial entities, it stands to reason that the same conclusion applies to space generally. Because this solution to the Dichotomy is weak, and because it is most analogous to the conclusion drawn from the *reductio* above, we may regard the latter to be weak as well.

V. MY ARGUMENT FOR THE RECEIVED VIEW

Finally, the fifth argument – *my* argument – for holding that Descartes assumes temporal atomism is *inference to the best explanation*. The assumption that Descartes is a *strong discontinuist* answers all three explanatory questions more satisfactorily than any other proposal. How might it answer all three of these questions? I suggest that Descartes has something like the following ‘Temporal Argument’ in mind and that this argument is what motivates the argument in FPSCP to begin with:

6. Time is strongly discontinuous. That is, the ultimate parts of time are actually separated by gaps.⁴⁸

⁴⁷Helpful discussions of different versions of PHD may be found in: Grünbaum (1967), Laraudogoitia (2000), Lee (1965), Moore (1993), Priest (1999), Sainsbury (1988), Salmon (2001), and Yablo (2000).

⁴⁸If Descartes does indeed subscribe to something like (6), then he most likely has in mind the image of a timeline that is interrupted at (uniformly separated) intervals. But this seemingly innocuous image disguises the fundamental incoherence involved in the notion of a temporal gap. As I argued in subsection II C, the notion of a temporal gap seems to be doomed by the dichotomy that I offered there. Again, a temporal gap is either extended/enduring or it is not. If it is, then it seems to be composed of time after all, contrary to hypothesis. In other words, if it is extended/enduring, then we seem to end up with the self-contradictory notion of a non-temporal duration. If it is not, then it is not clear in what sense it is a gap in the first place. This argument helps to show at least one respect in which a physical model of time is downright misleading. Moreover, this argument most likely motivates some scholars who are sympathetic to the received view to interpret (6) as Descartes’s view not of time ‘in the abstract’ but rather of objects’ existence in time. For the notion that an object’s existence is interrupted at (uniformly separated) intervals is perfectly coherent, however implausible.

7. \therefore if anything existed in the gap between t and $t + 1$, it would exist outside time.
8. I am in time and cannot exist outside time.
9. \therefore I cannot exist inside this gap.
10. \therefore if I am to make it from t over to $t + 1$, I cannot simply ‘jump’ or be delivered across the gap to it. For then, once again, I would exist inside this gap and therefore outside time.
11. \therefore if I am to exist at $t + 1$, I must be (re-)created at, not just delivered to, $t + 1$.
12. \therefore if I am not (re-)created at $t + 1$, I will cease to exist.

Regarding the first explanatory question, (10) would explain why Descartes assumes that no earlier part of my existence can cause (no less necessitate) a later part of my existence. The earlier part of my existence cannot ‘bring’ any effect to the next moment since it is ‘stuck’ on the other side of the temporal gap without a ‘bridge’ or a ‘ferry’.⁴⁹ Regarding the second explanatory question, (12) would help to explain why Descartes subscribes to the Counterfactual Assumption.⁵⁰ Regarding the third explanatory question, (11) would help to explain why Descartes identifies continuous (re-)creation and preservation. So inference to the best explanation provides us with a very strong reason for attributing the Temporal Argument – and therefore strong discontinuity – to Descartes. Even if this conclusion is right, it does not establish that FPSCP *commits* Descartes to strong discontinuity. But it does show that we have good

⁴⁹Secada (1990: 45–52) argues that Descartes’s answer to the first explanatory question is that causes cannot precede their effects; instead, they must be simultaneous with their effects. (I shall discuss Secada’s point here more fully in section VI, Objection 1.) But this cannot be the answer to the first explanatory question for a two-part reason. First, Secada’s interpretation of Descartes is incorrect. When Descartes says that causes and effects must be simultaneous, he means not that they must fully coincide in time but rather that there cannot be causation ‘at a temporal distance’ – i.e., that there cannot be an effect whose beginning is separated from the *end* of its immediate cause by at least one moment. An effect may still *follow* its immediate cause as long as the beginning of the effect overlaps with or is adjacent to any part, including the end, of the cause. Second, this alternative to Secada’s interpretation *fails* to explain why Descartes thinks that no earlier part of my existence can cause any later part of my existence. For apart from the notion that Descartes is a strong discontinuist, he has no reason to think that the earlier parts of my existence do not touch the later parts of my existence. Bennett (2001: 97–8) also criticizes Secada’s proposal here. But he does not believe that these criticisms commit him to the received view.

⁵⁰The notion that Descartes subscribes to the Counterfactual Assumption because of this line of reasoning ((6) to (12)) may seem to contradict the evidence above (in subsection III E) that Descartes regards the Counterfactual Assumption as self-evident. But I do not think that there is any real contradiction here. First, Descartes may think that the Counterfactual Assumption is self-evident because the line of reasoning behind it is itself self-evident. Second, Descartes’s Counterfactual Assumption may be overdetermined. It is not only self-evident but also substantiated by an independent line of reasoning.

reason to believe that Descartes subscribes to strong discontinuity and that this assumption largely motivates FPSCP.

Of course, strong discontinuity is quite implausible. And if my interpretation of Descartes is correct, it should certainly lead us to wonder just why on earth he would believe such a thing. But importantly, the fact that this conception of time is so implausible does not constitute an argument against this interpretation of Descartes. That is, we need to make a distinction between the (im)plausibility of strong discontinuity as a metaphysical thesis and the (im)plausibility of interpreting Descartes as a strong discontinuist. The fact that the former is implausible does not entail that the latter is implausible as well. Descartes, smart as he is, could just happen to subscribe to an implausible theory.⁵¹

VI. OBJECTIONS AND REPLIES

In this section, I shall reply to some objections that have been and/or might be raised against my interpretation of Descartes as (strong) discontinuist.

Objection 1

Secada (1990) argues that when Descartes suggests that the parts of time are independent of each other (see subsection IV B and footnote 40) – what Secada refers to as the ‘Principle of the Independence of Separate Segments of Time’ – neither is he endorsing temporal atomism nor does his view derive from an underlying belief in temporal atomism. Rather, Descartes is making a strictly *causal* claim, a claim that involves only some of his views about causation and nothing about the metaphysical nature of time (1990: 47, 71–2). In particular, Descartes’s

⁵¹Of course, if I am correct here, the question remains: just *why* does Descartes subscribe to temporal atomism? For historical reasons, see footnotes 5 and 52. I also suggested in section I that Descartes may have ignored the theory’s costs (implausibility and incoherence) for the sake of reaping its benefits (helping to support another proof of God’s existence). Finally, Williams (1978: 192–3) also suggests that, whatever Descartes’s actual reason(s), one justification that he might have used in support of this theory is the fact that temporal atomism would provide a convenient way of distinguishing between ‘deduction’, which is diachronic, and ‘knowledge’ or ‘intuition’, which is synchronic. Still, what Williams gives with one hand, he immediately takes away with the other. Just after offering this suggestion, Williams argues that what is *psychologically* non-continuous or instantaneous is not necessarily *metaphysically* instantaneous. So the notion of intuition does not necessarily require metaphysical time atoms. At most, it requires psychological time atoms, which may themselves have metaphysical duration. See also Secada (1990: 63–4).

suggestion that the parts of time are independent of each other amounts to two propositions:

13. my present existence (or the present existence of an object) requires a cause (1990: 67–8); and
14. this cause must be simultaneous with its effect (the existence of myself right now) (1990: 48–52, 67–9, 70).

From (13) and (14), it follows that

15. my past existence cannot be this cause.

With regard to (13), Secada suggests that Descartes does not offer any arguments for this position (1990: 68). Instead, he simply inherits the notion from ‘Medieval doctrines of causality’ (1990: 68, 69–70). With regard to (14), Secada suggests that Descartes subscribes to this position not because he subscribes to temporal atomism but rather because he simply adopts this view from his predecessors. Scholastics like Suárez and Fonseca, for example, had followed Aristotle in holding that the cause ‘taken in *actu secundo*’ – i.e., a cause ‘in act’ as opposed to merely a ‘potential cause’ – is necessarily simultaneous with its effect. Descartes follows them in assuming that there simply cannot be ‘productive activity,’ ‘causal or productive efficacy,’ ‘at a temporal distance’ (1990: 49–51).

Reply

I agree with Secada that Descartes subscribes to (13), (14) and (15). But far from ruling out my interpretation of Descartes as a strong discontinuist, Descartes’s adoption of these propositions is perfectly consistent with it. Consider again FPSCP:

1. The period of time for which I exist is divisible into a great many parts.
2. These parts are independent of each other.
3. ∴ The fact that I exist at time t does not necessarily mean that I will exist at a following time $t + 1$.
4. ∴ If I am to exist at $t + 1$, something must cause me to exist at $t + 1$.
5. ∴ If I am to exist for a period of time, I must be continuously (re-)created at each moment of the period.

As it turns out, Secada’s ‘Principle of the Independence of Separate Segments of Time’ is equivalent to (2), and the conjunction of his (13) and (14) is equivalent to (4).

Now that the relation between FPSCP and Secada’s position is clearer, it is easier to expose the latter’s weaknesses. Again, Secada thinks that the

'Principle of the Independence of Separate Segments of Time' – i.e., (2) – is equivalent to the conjunction of (13) and (14) – i.e., (4). But, first, this assumption is patently false. (2) and (4) clearly express different propositions. Second, Descartes himself by no means assumes that (2) and (4) are equivalent. On the contrary, as I suggested in subsection III A, Descartes intends (2) to be a justification of (4). And since identical propositions cannot justify one another, it follows that Descartes means (2) to be distinct from (4).

The fact that (13) and (14) are equivalent to (4) also casts doubt on Secada's conclusion that Descartes is making strictly a causal claim as opposed to a metaphysical claim about the nature of time. For even if Secada were right that (4) is a strictly causal claim, Descartes also adopts (2) – a proposition explicitly about the nature of time. Secada's theory seems simply to ignore this fact. Likewise, Secada fails to explain what is the relation between (2), (4) and the Counterfactual Assumption.

My theory has the advantage over Secada's of acknowledging not only (4) but also (2) and its relationship with (4) and the Counterfactual Assumption. In subsection III E, I argued that the inference from (3) to (4) is valid only if we insert the Counterfactual Assumption between them. So FPSCP really should look like this:

1. The period of time for which I exist is divisible into a great many parts.
2. These parts are independent of each other.
3. \therefore The fact that I exist at time t does not necessarily mean that I will exist at a following time $t + 1$.
- 3.5. Counterfactual Assumption: if something does not cause me to exist at $t + 1$, I will cease to exist at $t + 1$.
4. \therefore If I am to exist at $t + 1$, something must cause me to exist at $t + 1$.
5. \therefore If I am to exist for a period of time, I must be continuously (re-)created at each moment of the period.

Given this interpretation of FPSCP, we can see how (2), (3), and the Counterfactual Assumption nicely complement each other. As I indicated in subsection III E, (2) and (3) make merely a negative, not a positive, point. By suggesting that my past existence will not guarantee my future existence, they tell us only what is not sufficient for my continued existence – again, my past existence. They tell us nothing about what *is* sufficient, no less necessary. So (2) and (3) by themselves leave it an open question whether or not I will continue to exist and whether or not I will need anything to help me continue to exist. As I also suggested in subsection III E, the Counterfactual Assumption then proceeds to offer a determinate answer to this question. Again, it says that I *cannot* exist without a simultaneous cause. Given this analysis, it is difficult to see why we should accept Secada's notion that Descartes blindly inherits (4) from medieval philosophers like Suárez and Fonseca. Instead, my suggestion that (4) derives from (2), (3), and the Counterfactual Assumption seems just as, if not more, plausible.

Of course, Secada would likely respond by asking from where Descartes got (2), (3), and the Counterfactual Assumption themselves. At this point, however, I will surprise the reader by agreeing with Secada – but only in part. I agree with Secada that Descartes certainly was not the first to subscribe to (3) or the Counterfactual Assumption and therefore to (4). He clearly inherited these propositions from his predecessors. (Again, Secada thinks that they are primarily Aquinas and Suárez; I argue in footnote 21 that they also include de Silhon and Morin). But I *disagree* with Secada that this is all there is to the story, that Descartes simply inherited these propositions without further reflection or thought. I insist that Descartes makes a novel contribution to what is an otherwise familiar and unoriginal proof of God's existence. He does something novel with both (3) and the Counterfactual Assumption, something that many of his predecessors did not. In short, he tries to justify them. He tries to come up with a deeper reason to adopt them – something deeper than the mere fact that some medieval philosophers adopted them as well. Regarding (3), as I argued in subsection III A, Descartes attempts to justify it by deriving it from (1) and (2). And regarding the Counterfactual Assumption, as I argued in section V, Descartes attempts to justify it by deriving it from the doctrine of strong discontinuity.⁵²

In the end, Secada gives us no reason to think that I am wrong here, that Descartes adopts (4) for purely historical reasons rather than, at least in part, for a philosophical reason such as temporal atomism. To be sure, Secada does offer some other considerations against the received view of Descartes (1990: 48, 62 ff., 68–9). But I find these arguments to be, for the most part, inconclusive.

⁵²Of course, an especially persistent skeptic might ask if Descartes appropriates the doctrine of strong discontinuity, or at least temporal atomism, from the medievals as well, in which case Descartes's version of SCP would not be nearly as novel as I am suggesting here. Indeed, in footnote 5, I pointed to a number of Descartes's predecessors who seem to have adopted one version or another of temporal atomism. And it stands to reason that Descartes may have inherited this idea from them. But I have seen no evidence that any of these philosophers had significant influence on Descartes's thought. Moreover, both Sorabji and Turetzky say that they do not know of any other temporal atomists after the fourteenth century. So I think that it is very possible that Descartes came up with temporal atomism all on his own. Still, it would be foolish of me to rule out entirely the possibility that Descartes's views about time ultimately derived from some scholastic philosophers. While the project of tracing such possible influences on Descartes's thinking would go beyond the scope of this paper, it would certainly be worthwhile. One place to look is Porro (2001), a particularly rich collection of essays on different approaches to time from the period of late antiquity to Galileo. Having surveyed many of the papers in this anthology, I believe that if Descartes derived his temporal atomism from anybody, the most likely possibilities include: Albert the Great, Alexander of Hales, Father Manuel de Góis, Henry of Ghent, and/or especially Giles of Rome. See the following essays in Porro (2001): Carlos Steel, 'The Neoplatonic Doctrine of Time and Eternity and its Influence on Medieval Philosophy', 19–25; Porro, 'Angelic Measures: Aevum and Discrete Time', 152–7; Guido Alliney, 'The Concept of Time in the First Scotistic School', 199; and Mário S. de Carvalho, 'The Concept of Time According to the Coimbra Commentaries', 380.

Objection 2

Descartes argues that because we cannot conceive of a finite being or 'substance' (either a material object or mind) that does not endure, duration is an 'attribute' (an essential property) of every finite being. No finite being that exists can exist for (only) a durationless instant. It must exist for at least a duration, a period of time.⁵³ Therefore even God cannot create a finite being for a durationless instant. Yet if Descartes were a temporal atomist, he would have to hold that God *can* create a finite being for (only) a durationless instant before it is destroyed and has to be created again. So Descartes is committed to rejecting temporal atomism.⁵⁴

Reply

First, the passages cited in footnote 53 do not support the conclusion that Descartes subscribes to the *metaphysical* thesis that finite beings cannot exist for durationless instants. At most, they support only the conclusion that Descartes subscribes to the *psychological* thesis that we cannot think of a given being or substance without the attribute of duration. Second, Objection 2 suggests that God cannot create a finite being for (only) a durationless instant. Yet Descartes expresses skepticism about this kind of assumption:

But I do not think that we should ever say of anything that it cannot be brought about by God. For since every basis of truth and goodness depends on his omnipotence, I would not dare to say that God cannot make a mountain without a valley or bring it about that 1 and 2 are not 3. I merely say that he has given me such a mind that I cannot conceive a mountain without a valley, or a sum of 1 and 2 which is not 3, such things involve a contradiction in my conception. I think the same should be said of a space which is wholly empty, or of an extended piece of nothing, or of a limited universe.⁵⁵

(Letter to Arnauld (29 July 1648), AT 5: 224, CSMK 3: 358–9)

⁵³See *Principles* 1 56, 62 (AT 8A: 26, 30, CSM 1: 211–12, 214–15). Frankfurt (1991, 6, 7) and Garber (1992: 67) also discuss this point.

⁵⁴See Garber (1992: 272–3). Garber does, however, think that this argument ultimately fails to establish that Descartes rejects temporal atomism. For 'however much Descartes might be forced to accept [this argument] on his own terms, there is no evidence that would suggest that he ever saw it'.

⁵⁵Other passages in which Descartes argues that God's omnipotence is unlimited (including the passages in which he maintains that God freely willed the 'eternal truths') may be found in the following: Letter to Mersenne (15 April 1630), AT 1: 145–6, CSMK 3: 23; Letter to Mersenne (6 May 1630), AT 1: 149–50, CSMK 3: 24–5; Letter to Mersenne (27 May 1630), AT 1: 153–4, CSMK 3: 25–6; Letter to Mesland (2 May 1644), AT 4: 118–19, CSMK 3: 235; Letter to More (5 February 1649), AT 5: 272–3, CSMK 3: 362–3; *Fifth Set of Replies*, AT 7: 380, CSM 2: 261; *Sixth Set of Replies*, AT 7: 431–2, 435–6, CSM 2: 291, 293–4.

According to Descartes, then, the mere fact that we find a given scenario to be inconceivable does not necessarily mean that God cannot achieve it. On the contrary, the fact that we find something to be inconceivable tells us something only about our minds, not necessarily about what God cannot do. So the mere fact that our limited minds cannot comprehend an object that exists for a durationless instant hardly shows that God cannot produce such an object. In this way, Descartes's principle that finite beings necessarily endure does not necessarily commit him to rejecting temporal atomism. The passage above suggests that if he were pressed on this issue, he would concede that this principle of his (that finite beings necessarily endure) is more a report about the limits of human conceivability than a necessary truth about metaphysical reality.⁵⁶

Objection 3

It is problematic to suggest that God's (re-)creation of me is continuous and my existence is discontinuous. For if such were really the case, then we would end up with the very bizarre result that God is not always successful, that there are moments at which God is unsuccessfully attempting to (re-)create me. Naturally, Descartes simply would not accept this consequence. Descartes's God is infallible. Therefore if God's (re-)creation of me is continuous (as Descartes says), then Descartes must also hold that my existence is continuous as well. This conclusion is only reinforced by the fact that Descartes always refers to the activity of my being (re-)created as 'continuous'.⁵⁷

Reply

Gueroult (1953: esp. 284–5, 1984: esp. 201–2) offers the correct response to this argument.⁵⁸ God's (re-)creative activity is just as discontinuous as my existence. God (re-)creates me only at *t* and not in between the moments that exist. Yet it is still appropriate to refer to this possibility as *continuous* (re-)creation. For what corresponds to the adjective *continuous* here is not infinite divisibility but rather occurrence *at every moment*. In other words, according to Descartes's doctrine of continuous (re-)creation,

⁵⁶This argument could also be used to show that, contrary to the passages referred to in footnote 9, Descartes does not rule out the metaphysical possibility of extended material atoms either.

⁵⁷See Arthur (1988: 354–5), Frankfurt (1991: 14), and Laporte (1950: 158–9).

⁵⁸See also Kemp Smith (1966: 202) and Wahl (1994: 69–70).

God creates me, and therefore I exist, at every consecutive moment (between conception/birth and death). And this conclusion is perfectly compatible with not only weak discontinuity but also strong discontinuity. As Gueroult says, continuous (re-)creation 'can be accomplished with a repetition of the discontinuous'. But, notice, *discontinuous* here means moments separated by *temporal gaps*, not moments separated by *other moments*.

Objection 4

My reply to Objection 3 cannot be correct because it turns Descartes's doctrine of *continuous* (re-)creation into a doctrine of *continual* (re-)creation.

Reply

Objection 4 assumes (a) that there is a distinction between *continuous* and *continual*, (b) that Descartes has this distinction in mind when he uses such terms, and (c) that the particular meaning Descartes wishes to convey is *continuous* rather than *continual*.

(a) is certainly true. While *continuous* denotes continuation without interruption, *continual* denotes continuation with interruption. But, first, if continuation without interruption is taken to entail infinite divisibility and/or the absence of 'instants' of non-existence intervening between the moments of my existence, then Objection 4 simply begs the question against the received view. For we have just seen that an alternative interpretation exists, an interpretation that is perfectly consistent with temporal atomism (weak or strong). Again, it is the interpretation of continuous (re-)creation as creation at every moment. So even if we assume that Descartes thought of creation as continuous, this assumption still would not necessarily rule out the interpretation that I have just offered. He might still hold that interruptions can occur only *in* time, in which case intervening temporal gaps would not really constitute interruptions in the first place.

(b) and (c) are both highly problematic. Descartes uses these kinds of term (*continuous* or *continual*) only twice.⁵⁹ Indeed, in both cases, he uses the same word – the Latin term *continuo*. But first, this language alone gives us no reason to think that he intends this term to mean one thing rather than the other. On the contrary, Cottingham, Stoothoff, and Murdoch themselves translate this term *both* ways – in one place as 'continuously' (CSM 2: 79), in the other as 'continual' (CSM 2: 254). Second, even if (contrary to fact) *continuo* were closer in meaning to

⁵⁹AT 7: 110, 369; CSM 2: 79, 254.

continuous in the sense of infinitely divisible, it would still be foolish to let our interpretation of Descartes's doctrine of creation and his corresponding metaphysics of time be determined by such sparse, and quite possibly haphazard, usage. Instead, our interpretations should be guided much more by his doctrinal explanations themselves.⁶⁰ Third, these doctrinal explanations on which we should be primarily relying actually incline away from continuous-qua-infinitely-divisible and toward continuous-qua-occurring-at-every-moment. For Descartes usually suggests that continuous (re-)creation occurs at 'each moment', 'every moment', or 'all the moments'.⁶¹

Objection 5

When Descartes suggests that his life is divisible into 'countless' parts, what he means is that time is infinitely divisible.⁶² Therefore, far from holding that time is atomistic, Descartes holds that time is continuous.

Reply

First, 'countless' for Descartes could just mean *many* or *too many to count*, not necessarily *infinitely* many. There is no evidence that Descartes has the latter rather than the former in mind.

Second, Secada (1990: 60–2, 71) argues that even if Descartes does believe that time is infinitely divisible, he still does not necessarily believe that it is continuous; for (a) infinite divisibility or 'density' does not entail continuity (1990: 54–5, 57–8), (b) at least one predecessor of Descartes's – Suárez – recognized (a) (1990: 55–6), (c) Descartes is familiar with Suárez, and therefore (d) Descartes can be reasonably assumed to have been aware of (a) as well (1990: 60).⁶³ And if Descartes were aware of (a), then his supposed belief (according to Objection 5) that time is infinitely divisible still would not necessarily commit him to the view that time is continuous. On the contrary, he would still have logical space to believe that time is discontinuous or atomistic as well.

In all fairness, however, (d) – and therefore Secada's argument – is rather weak. Descartes had many predecessors who said many things. He cannot reasonably be interpreted to have known and implicitly adopted whatever

⁶⁰See the citations listed in footnote 32.

⁶¹See AT 5: 53, CSMK 3: 320; AT 7: 49, CSM 2: 33; AT 7: 109, 370, CSM 2: 79, 255; AT 8A: 64, CSM 1: 242. See also Bridoux (1953: 493).

⁶²See Secada (1990: 62).

⁶³Still, while Secada (1990: 60) argues that Descartes does not likely believe that infinite divisibility entails continuity, Secada is not 'obliged to maintain that Descartes believed density does not entail continuity'. My claim is that he believed neither the one nor the other.'

his predecessors said and that he did not explicitly deny. This is especially the case when we consider that Suárez distinguished between continuity and infinite divisibility only rather briefly and somewhat obscurely.⁶⁴ Moreover, there is actually some evidence weighing against (d) – namely, the fact that Descartes never explicitly refers to these specific passages in Suárez nor explicitly notes the distinction between infinite divisibility and continuity that is supposedly contained in these passages. In the end, Descartes's discussions both of continuity and of infinite divisibility are brief, sparse, and relatively unsophisticated. They offer no good reason to think that Descartes adopts, no less has any awareness of, Suárez's treatment of the distinction between infinite divisibility and continuity. So in my response to Objection 5, I rely primarily on my first argument, not Secada's argument.

Objection 6

As Descartes himself argues in the *Fifth Set of Replies*, he is talking only about objects in time, not time itself or time 'in the abstract'.⁶⁵ If there are gaps anywhere for Descartes, they exist in my duration (and in the duration of everything else that endures), not in time itself. Therefore my argument that the gaps exist in time itself for Descartes cannot be correct.

Reply

In most passages, Descartes attributes parts-independence not to objects in time but to time itself. Indeed, in *Principles* 1 21 (AT 8A: 13, CSM 1: 200), Descartes says that 'the nature of time is such that its parts are not mutually dependent and never coexist'. Now, one might argue that 'the nature of time' here is synonymous with 'the nature of an object's duration'. But this suggestion is refuted by the fact that Descartes explicitly acknowledges in the very preceding sentence the distinction between time in the abstract and objects in time: 'It will be impossible for anything to obscure the clarity of [FPSCP], if we attend to the nature of time or of the duration of things'. The fact that Descartes makes an explicit distinction between the 'nature of time' and the 'duration of things' and

⁶⁴According to Secada, Suárez makes the point that 'adjoining parts which are both extrinsically bound are also, and perhaps more clearly, neither continuous nor contiguous' (1990: 56). Secada himself then admits that 'Suárez did not elaborate on this matter.' Still, Secada thinks that Suárez's brief comments on 'this matter' are enough not only to 'provide the elements for an argument that such a possibility, a dense but discrete quantity, is irrelevant to discussions of continuity' (1990: 56) but also for Descartes to recognize the same. Needless to say, this is a very slender basis on which to predicate an entire interpretation of Descartes's own views on time.

⁶⁵See Bennett (2001: 97).

then proceeds to discuss ‘the nature of time’ is the clearest possible proof that he has in mind time in the abstract rather than objects in time. Likewise, in different sections, he formulates premise (1) of FPSCP in terms of ‘the divisions of time’ (AT 7: 109, CSM 2: 78–9), the ‘separate divisions of time’ (AT 7: 110, CSM 2: 79), and ‘the present time and the immediately preceding time’ (AT 7: 165, CSM 2: 116).

In fact, one of the *only* places in which Descartes explicitly speaks in terms of an object’s duration rather than in terms of time in the abstract is in his response to Gassendi in the *Fifth Set of Replies* (mentioned in Objection 6 above).⁶⁶ There Descartes says that the fact that objects require not merely a cause of ‘coming into being’ but a cause of ‘being itself’

can be plainly demonstrated from my explanation of the independence of the divisions of time. You try in vain to evade my argument by talking of the necessary ‘connection’ which exists between the divisions of time considered in the abstract. But this is not the issue: we are considering the time or duration of the thing which endures, and here you would not deny that the individual moments can be separated from those immediately preceding and succeeding them, which implies that the thing which endures may cease to be at any given moment.

(AT 7: 369–70, CSM 2: 254)

But there are a number of reasons why we should not accept Descartes’s suggestion that he has in mind only objects in time and *not* time in the abstract in his formulation of FPSCP.

First, it directly contradicts what he says in *Principles* 1 21 (cited toward the beginning of this Reply).

Second, majority rules. It is only this one passage against not only *Principles* 1 21 but the other three cited in the first paragraph of this Reply.

Third, if Descartes really held that *only* the parts of an object’s continued existence required continuous (re-)creation and therefore that the parts of time in the abstract do *not* require continuous (re-)creation, then Descartes would be committed to the view that time continues to ‘flow’ independently of God. And given that not even the *axioms of logic* (the ‘eternal truths’) exist independently of God for Descartes (see footnote 55), we have good reason to believe that Descartes would ultimately reject this notion.

Fourth, even if we were to accept Descartes’s suggestion that he has in mind only objects in time and *not* time in the abstract, it is still not clear that

⁶⁶Another place in which Descartes talks about an object in time rather than time in the abstract is in his Letter to Chanut (6 June 1647) (AT 5: 53, CSMK 3: 320). There Descartes talks about the ‘eternal past duration of the world’, ‘its eternal future duration’, and the ‘infinite duration which the world must have in the future’. But these quotations take place in the context of a discussion of the nature of the world, not of the nature of time. So they fail to contradict my point that Descartes’s main focus in his discussions of *time* is on time in the abstract, not objects in time.

this suggestion would help his argument for the conclusion that my continued existence requires a positive cause. As I suggested in subsection III E and as Gassendi suggests in the second of two arguments (which I cite and discuss toward the end of this Reply to Objection 6), even if the earlier parts of my existence are independent of the later parts in the sense that the former do not guarantee the existence of the latter, the conclusion that the later parts of my existence require a positive cause still does not seem to follow. Again, they may very well still require only the negative cause that nothing get in their way.

Fifth, it raises more explanatory questions than it answers (and we have just seen that it answers very little) to suggest that Descartes holds that the parts only of objects in time and not necessarily of time itself are independent of one another. If time is not strongly discontinuous, then why am *I* strongly discontinuous? Why do not I flow just as continuously as time itself? Conversely, if my parts are independent of one another, then why are not the parts of time independent of one another? What gives time and not myself this 'continuity privilege'?

Sixth, my argument in this paper has *not* been that Descartes explicitly states or assumes that the parts of time in the abstract are strongly discontinuous. Again, my argument has been that the textual evidence provides a strong basis for *inferring* that Descartes ultimately subscribes to strong discontinuity. And even very intelligent philosophers such as Descartes may not always be aware of the ultimate assumptions to which they subscribe. So even if Descartes genuinely believes in the *Fifth Set of Replies* that FPSCP concerns only objects in time and not the nature of time itself, this belief may just be wrong. He may just be temporarily unaware of the deeper assumptions that lead him to propose FPSCP in the first place.

Finally, it is relevant to note that Descartes misinterprets Gassendi in a number of ways. In response to FPSCP, Gassendi offers two different arguments. His first argument suggests that, contrary to Descartes's assumption that the parts of my lifetime are independent of each other, the parts of my lifetime are *not* independent of each other:

Here I am tempted to ask if we can think of anything whose parts are more inseparable from one another than your duration. Can we think of anything whose parts are more inviolably linked and connected? Is there anything whose later parts are more inevitable, or more closely tied to the earlier parts, or more dependent on them?

(AT 7: 301, CSM 2: 209)

Gassendi's second argument is that even if the parts of my duration *were* independent of each other, this fact would still not mean that each later part requires a positive cause:

[W]hat difference does this dependence or independence of the parts of your duration make to your creation or preservation? Surely these parts are merely external – they follow on without playing any active role. They make no more difference to your creation and preservation than the flow or passage of the particles of water in a river makes to the creation and preservation of some rock past which it flows. You say that from the fact that you existed a little while ago it does not follow that you must exist now. I agree; but this is not because a cause is needed to create you anew, but because there is no guarantee that there is not some cause present which might destroy you, or that you may not have some weakness within you which may not finally bring about your demise.

(AT 7: 301, CSM 2: 209–10; see also subsection III E and footnote 27 above)

Descartes's response to Gassendi's arguments (quoted above in the second paragraph of this Reply) suggests that the argument in which Gassendi talks 'of the necessary "connection" which exists between the divisions of time in the abstract' fails to 'evade' Descartes's argument that because (a) the 'divisions of time' are independent, (b) not only an object's coming into being but also its continuing to be requires a positive cause. But, first, the argument in which Gassendi talks 'of the necessary 'connection' which exists between the divisions of time' is his first argument above. And, contrary to Descartes, Gassendi's first argument does not attempt to show that (b) does not follow from (a). Rather, Gassendi's first argument attempts to show that (a) is false. It is Gassendi's *second* argument that attempts to show that (b) does not follow from (a). Descartes, then, seems not to recognize the fact that Gassendi has proposed not just one but two different arguments against FPSCP. Second, contrary to Descartes's assertion, Gassendi does not speak of time in the abstract in *either* argument. Instead, in the first argument, he speaks of 'the parts of your lifetime' and 'the parts ... [of] your duration'. And in the second argument, he speaks of 'the parts of your duration'. So it is Descartes, not Gassendi, who has introduced the concept of 'time in the abstract'. And this fact gives us all the more reason to think that this notion is more central to FPSCP than Descartes himself may even realize.

Objection 7

The very assumption that Descartes *has* a view on the nature of time in itself – a *metaphysics* of time, so to speak – is misguided. For the notion that time has an intrinsic nature presupposes that time is mind-independent. But Descartes suggests at least twice that duration is nothing more than a 'mode of thought' (*Principles* 1 55, 57 (AT 8A: 26, 27 CSM 1: 211, 212)). And this suggestion implies that duration – and therefore time – is mind-dependent.

Reply

There are several problems with Objection 7. First, it is not just an objection to my own view of Descartes as a strong discontinuist. It is an objection to the entire debate regarding Descartes's view of time. For the entire debate presupposes that Descartes *has* a metaphysics of time in the first place. The only question is *what* this metaphysics is. But it is implausible to think that all of the scholars who have participated in this debate are amply refuted by two minor passages tucked away in the *Principles*.

Second, Objection 7's assumption that Descartes's having a metaphysics of time presupposes that Descartes believes that time is mind-independent needs clarification. For there are two different senses of mind-independence. Each naturally contrasts with correspondingly different senses of mind-dependence. On the one hand, something is mind-dependent in the first sense – call it 'mind-dependent₁' – if it emanates from the imagination in the sense that an illusion or hallucination does. So something is 'mind-independent₁' if it is *not* strictly imagined. On the other hand, something is mind-dependent in the second (Kantian) sense – call it 'mind-dependent₂' – if it is, or depends on, a human construct or intuition and therefore would not exist if there simply were no (human) minds around to conceive or perceive it. So something is 'mind-independent₂' if it would or might exist even if no (human) minds were around to conceive or perceive it. I hold (with Kant) that in order to have a metaphysics of time, Descartes need not assume that time is mind-independent₂. Rather, he need assume only that time is at least mind-independent₁. And this position still leaves room for him to think that time is mind-dependent₂.

Does Descartes think that time is (at least) mind-independent₁? I think so. First, even if (contrary to fact, I think) these passages in the *Principles* clearly demonstrated that Descartes thought that time is mind-dependent₁, the way in which Descartes speaks of time in FPSCP clearly demonstrates just the opposite – that Descartes thinks that time is mind-independent₁. So at worst, whatever conclusions we draw about Descartes's view of time from FPSCP have to be qualified by noting that Descartes seems to think quite differently about time in the *Principles*. Second, even in the *Principles* themselves, Descartes suggests that *duration* is sometimes used in another sense, a sense which is mind-independent₁:

[F]inally, when we are simply thinking in a more general way of what is in a substance, we use the term *attribute*. Hence we do not, strictly speaking, say that there are modes or qualities in God, but simply attributes, since in the case of God, any variation is unintelligible. And even in the case of created things, that which always remains unmodified – for example existence or duration in a thing which exists and endures – should be called not a quality or a mode but an attribute.

(*Principles* 1 56 (AT 8A: 26, CSM 1: 211–12)

Third, it is not clear that there really is a tension or contradiction between the two passages from the *Principles* and FPSCP in the first place. I shall explain why in the course of this and the following two paragraphs. In *Principles* 1 57 (AT 8A: 27, CSM 1: 212), Descartes does three things. First, he announces that '[s]ome attributes or modes are in the very things of which they are said to be attributes or modes, while others are only in our thought.' Second, he distinguishes between time qua 'the measure of movement' and 'duration taken in the general sense'. Third, he argues that 'the measure of movement' is 'simply a mode of thought.' The natural implication of these three points is that 'duration taken in the general sense' is *not* 'simply a mode of thought' but rather 'in the very things of which [it is] said to be [an] attribute[] or mode[]'.

What, then, is this 'things-inherent' mode or attribute 'duration taken in the general sense'? Unfortunately, Descartes does not really tell us. But it stands to reason that it is the *object* of the 'measure of movement'; the particular, mind-independent₁ duration that is being measured. One might argue that this inference is wrong, that 'duration taken in the general sense' is equivalent to time itself. But the main problem with this argument is that it does not really make sense to say that time itself is 'in the very things of which [it is] said to be [an] attribute[] or mode[]'. For, first, we tend to think *not* that time is in (no less an attribute of) all things but rather just the opposite – that all things are in time. Second, we *do* tend to think (a) that each object or motion has its own particular duration and therefore (b) that, in this sense, an object's or motion's duration is an 'attribute or mode' of – or 'in' – that object or motion and therefore (c) that the concept of duration *in general* – what Descartes presumably means by 'duration taken in the general sense' – is the concept of an attribute that inheres, or is instantiated, in every object and motion.

What implications, then, does this position have for time itself? In addition to the implication already noted above that time is not equivalent to 'duration taken in the general sense' and therefore is not necessarily '[an] attribute[] or mode[]' of things, I think that another implication that follows is that time is mind-independent₁. For we have just seen that individual durations, not to mention 'duration taken in the general sense', are mind-independent₁. And time, for Descartes, is composed of these individual mind-independent₁ durations 'pieced together' in a consecutive, non-overlapping series. So if the constituents of time (whether or not atomistic) are mind-independent₁, it follows that time must be mind-independent₁ as well.

Objection 8

Descartes explicitly denies strong discontinuity in a letter to More (15 April 1649). In a previous letter (5 March 1649), More had proposed: 'If God

destroyed this world and much later created a new one out of nothing, the interval without a world would have its own duration which could be measured in days, years, and centuries' (AT 5: 302). Descartes responds:

I think it involves a contradiction to conceive of any duration intervening between the destruction of an earlier world and the creation of a new one. To relate this duration to a succession of divine thoughts or something similar would simply be an intellectual error, not a genuine perception of anything.⁶⁷

(AT 5: 343, CSMK 3: 373)

Arthur thinks that this passage 'firmly refutes' the interpretation of Descartes as strong discontinuist. According to Arthur, Descartes is explicitly denying that there can be a 'repeated alternation between the state of being and the state of not-being',⁶⁸ which is precisely what strong discontinuity entails.⁶⁹

Reply

Descartes's statement that 'it involves a contradiction to conceive of any duration intervening between the destruction of an earlier world and the creation of a new one' can be interpreted in at least two different ways, both of which are consistent with the possibility that Descartes is a strong discontinuist. First, Descartes might be saying that 'it involves a contradiction to conceive of' nothing but time existing – i.e., a duration of time in which no universe exists. On this interpretation, what is impossible for Descartes is not temporal gaps – i.e., absences of time – but rather 'empty time' – i.e., time existing without anything else. It is therefore still perfectly consistent with Descartes's being a strong discontinuist. So if this first interpretation is correct, then Objection 8 fails.

Second, Descartes might very well be denying the logical possibility of enduring temporal gaps. Indeed, we have already seen good reason to embrace the same doubt. Again, if temporal gaps endure, then it is not clear how they are temporal *gaps* in the first place. Importantly, this second interpretation of Descartes's view is perfectly consistent with Descartes's being a strong discontinuist. For, first, it does not show that Descartes

⁶⁷See also *Principles* 1 55 (AT 8A: 26, CSM 1: 211): '[W]e should regard the duration of a thing simply as a mode under which we conceive the thing in so far as it continues to exist.'

⁶⁸Kemp Smith (1962: 132).

⁶⁹Frankfurt (1991: 6) and Gueroult (1953: 280–1; 1984: 199) also interpret the passage above by Descartes in this way. For this reason, Gueroult attributes weak rather than strong discontinuity to Descartes.

equally denies the possibility of *durationless* temporal gaps. Second, Descartes may still very well believe that such durationless gaps are consistent with strong discontinuity.

Of course, I have argued repeatedly in this paper that the notion of a temporal gap, whether enduring or durationless, is highly problematic. (See subsection II C and footnote 48.) But this fact is a problem only for the theory of strong discontinuity, not necessarily for the view that Descartes is a strong discontinuist. Moreover, the fact that the theory of strong discontinuity is highly problematic constitutes support for the conclusion that Descartes is *not* a strong discontinuist *only if* it can be shown that Descartes himself is aware of this fact. But I do not believe that there is any textual evidence for this claim.

Finally, I should point out that I mean my Reply to Objection 8 to be a bit less ambitious than my replies to the other objections in this section. Since I think that Objection 8 qualifies as one of the stronger arguments against my interpretation of Descartes, I have set my sights somewhat lower here. In this Reply to Objection 8, my goal is not to show that Objection 8 *is* clearly wrong but only that it *may* be wrong; not that my interpretation of Descartes clearly defeats it but only that it can indeed survive it; not that Descartes's letter to More *must*, or even necessarily *should*, be read in the manner that I suggest but only that it *can* be read in that way. So, far from aiming to silence the opposition, my Reply to Objection 8 is designed merely to keep my interpretation of Descartes in the running. It is the *rest* of my paper that is designed to put it over the top.

Objection 9

In the third argument of my Reply to Objection 7, I argued that, for Descartes, 'duration taken in the general sense' is *not* 'simply a mode of thought' but rather 'in the very things of which [it is] said to be [an] attribute[] or mode[]'. But if duration for Descartes is a mode of existing things, then he is committed to the view that there cannot be 'empty duration' – i.e., duration without any existence. And strong discontinuity requires there to be empty duration. Therefore Descartes is committed to rejecting strong discontinuity.

Reply

As I suggested in the first argument of my Reply to Objection 8, strong discontinuity does *not* require there to be empty time (or duration). It requires there to be only temporal gaps – i.e., absences of time – which is different.

Objection 10

Arthur offers the following argument:

[There is] the exegetical problem of why Descartes would introduce the hypothesis of the discontinuity of time in order to explain the equivalence of creation and conservation. Surely if creation is really discontinuous, then it cannot be equivalent to conservation: repeated creation is, one would think, the very opposite of conservation. (Suppose for instance that we could recreate mammoths by cloning cells of their frozen remains, and that we did so every time the species became extinct. To call this a 'conservation' program would surely be regarded as an abuse of language of Orwellian proportions).

(1988: 357)

I take Arthur to be arguing that as soon as the mammoths passed out of existence – i.e., there were no longer any mammoths running around – then this species became extinct. So even if a scientist helped to 'revive' the mammoths – whether it be one second or one million years later – the 'new' mammoths would still constitute a species that is different from the 'old' mammoths, in which case the scientist would not have succeeded in conserving the old mammoths. The new (species of) mammoths might be qualitatively similar to – i.e., share all of the same intrinsic properties as – the old (species of) mammoths. But the new species would not be *numerically* identical to the old species, since there was a period of time during which the old species no longer existed (except perhaps *in potentia*).

Likewise, then, with individual creatures. If I cease to exist at t and am then (re-)created at $t + 1$, the creature that exists at $t + 1$ may be qualitatively similar to the creature that existed at t . But because the creature at t passed out of existence, the creature at $t + 1$ cannot be numerically identical with the creature at t . They have two different identities. Temporal atomism plus continuous (re-)creation negates the possibility of my retaining my identity and so being conserved from one moment to the next. So if I am (re-)created at $t + 1$, this (re-)creation would not really be an instance of conservation either.

Reply

If I lose my identity from one moment to the next, it is not because time is either weakly or strongly discontinuous or because I alternate between being and non-being. Rather, it is because I am newly (*re-*)created at every moment. This point suggests that if FPSCP works (in which case I am indeed (re-)created from one moment to the next), and if I do indeed lose my identity at all from one moment to the next, then I lose my identity whatever

the nature of time – even if it is infinitely divisible. Importantly, if my point here is correct, then Descartes cannot be right when he suggests that there is merely a ‘distinction of reason’ between continuous (re-)creation and conservation. For if it is indeed (re-)creation – not temporal discontinuity – that is inconsistent with the maintenance of identity, then (re-)creation is not only not identical to conservation but the very condition of its impossibility.

I would venture to say, however, that I do not lose my identity at all – even if FPSCP works and even if it assumes that time is strongly discontinuous. That is, even if I am (re-)created at every moment and even if there are gaps between each moment and the next (strong discontinuity), it is still true to say that I am the same person at $t + 1$ that I was at t . For I retain my identity over time as long as I retain the bulk of my intrinsic and extrinsic properties *from one moment to the next* – however this retention is maintained and whatever the composition of time. This is the difference between me and the mammoths. There was a (huge) gap of time between their passing into non-being and their (hypothetical) revival. They did not continue to exist from one moment to the next. There was no continuity in *any* sense. That is why the newly revived species may not be considered numerically identical to the earlier species. But if this gap of time had been shrunk to an intervening temporal gap, then it *would* be right to consider ‘them’ numerically identical and therefore conserved.

Indeed, although he does not seem to realize it, Arthur himself assumes as much. He assumes that the earlier species remained numerically identical to itself for as long as it lasted. Yet if, contrary to fact, he took his argument to its logical extension, he would have to reject this assumption and maintain that if time is composed of atoms, then the identity of this species changed at each moment of its existence.

Objection 11

Arthur (1988: 367) cites the following passage in a letter from Descartes to More (5 February 1649) as evidence that Descartes rejects the possibility of material atoms:

I say that it would imply a contradiction for there to be atoms which are conceived of as extended and at the same time indivisible, since although God could have made things which are such that they are not divided by any created being, we certainly cannot understand him as having been able to deprive himself of his own faculty of dividing them.⁷⁰

(AT 5: 273, CSMK 3: 363)

⁷⁰See also footnote 9 for other places in which Descartes makes similar remarks.

Arthur then argues that if Descartes is willing to reject the possibility of material atoms for this reason, then there is good reason to think that he would reject the possibility of time atoms as well. He says, '[E]ven though Descartes never explicitly discusses time atoms, he explicitly rejects material indivisibles, and, I maintain, his arguments against them should apply equally well to time.'

Reply

First, Arthur once again misinterprets the conclusion of Descartes's argument. Descartes's conclusion is not that there cannot be material atoms. Rather, Descartes's conclusion is that there cannot be extended *and* indivisible material atoms. So even if the analogy Arthur wishes to draw between Descartes's view on material atomism and Descartes's view on temporal atomism were legitimate, the most it would show is that Descartes rejects the possibility of extended (or enduring) *and* indivisible time atoms. It *would not* show that Descartes rejects the possibility of *non*-extended or *non*-enduring time atoms. In fact, as I point out in footnotes 11 and 39, Arthur himself acknowledges that Descartes accepts the possibility of non-extended time atoms.

Second, Descartes rejects the possibility of material atoms that are both extended *and* indivisible because *nothing* is indivisible for God. But if all it took to show that Descartes is not a temporal atomist was that there cannot be indivisible time atoms for God, then the answer to the title of this paper could have been determined in less than a page. Clearly, such an approach is too easy and overlooks all of the other reasons and complications that have made the answer to this question the focus of a legitimate interpretive debate. In the end, as I suggested in footnote 6 above, the question of whether time is ultimately divisible or indivisible for Descartes is a question not about whether or not Descartes's God can divide time infinitely (of course he can! – case closed) but about whether or not a God *stripped of* the powers to do what is either logically impossible or inconceivable (for us) can divide time infinitely.⁷¹

Objection 12

If we consider the larger historical context in which Descartes offers SCP, we see that SCP is Descartes's own version of what is really nothing more than a traditional medieval argument for God. And this argument – call it the 'Necessary Being Argument' – does not at all assume or need strong

⁷¹Secada (1990: 66) agrees with me that 'the Cartesian attack on material atomism should not lead to the claim that he held that time is continuous'.

discontinuity. Therefore neither does Descartes's SCP. The Necessary Being Argument runs like this:

16. The Principle of Sufficient Reason (PSR): every contingent being that exists must have a sufficient cause of its existence. Otherwise, it would not exist.
17. I am a contingent being. I am contingent in the sense that my hypothetical non-existence (considered in itself, apart from the actual cause of my existence) does not entail a contradiction.
18. ∴ I must have a sufficient cause. Call this cause 'A'.
19. If A is a contingent being, then A must have a sufficient cause – i.e., B.
20. If we keep going back in the causal chain like this, either (a) we will end at a non-contingent – i.e., necessary – being (God) or (b) there is an infinite regress or chain of contingent causes extending backward from myself.
21. Suppose that there is an infinite chain of contingent causes extending backward from myself.
22. ∴ nothing initiates the chain.
23. ∴ the chain itself has no sufficient cause.
24. Since each cause in the chain is a contingent being, the entire chain of causes is a contingent being.
25. ∴ there is a contingent being that has no sufficient cause.
26. Contradiction. [(16) and (25)]
27. ∴ (20)(a) must be the case. The chain must have a sufficient cause, and this cause must be a necessary being (God).
28. ∴ God must exist.^{72,73}

⁷²I take this syllogism to be the clearest and most complete version of the Necessary Being Argument. Medieval philosophers who offered this argument – e.g., Aquinas, Avicenna, Maimonides – did not necessarily formulate it in quite these terms or explicitly state every one of steps (16) through (28). Spinoza also endorses something like the Necessary Being Argument in Letter 12.

⁷³Harry Frankfurt attributes the following very primitive version of the Necessary Being Argument to Descartes:

[S]ince the existence of the world is not self-caused, the world must be created by some agency external to it. Just as those things that are created must be created because they cannot (as God does) derive their existence from themselves, so they must be continuously created because they cannot derive the continuation of their existence from themselves either (1991: 13–14).

So Frankfurt's explanation of why Descartes thinks that my continued existence requires continuous (re-) creation is that Descartes thinks that my continued existence needs *some* cause (PSR). And since Descartes thinks that this cause is not me, he concludes that it must be something other than – i.e., external to – me. I regard this formulation as a version of the Necessary Being Argument because the premise that my continued existence needs *some* cause implicitly assumes PSR. I regard it as a *very primitive* version of the Necessary Being Argument because it does not involve any of the elaborate reasoning exhibited in steps (16) through (28).

Since the Necessary Being Argument does not even make any mention of time, it certainly does not rest on any particular view of time. Therefore, since Descartes's SCP is merely a version of the Necessary Being Argument, SCP does not rest on any particular view of time either – including, of course, strong discontinuity.

Reply

There are three problems with reducing Descartes's SCP to the Necessary Being Argument. First, it fails to take into account the heavy emphasis Descartes places on time in SCP. As Objection 12 mentions, the Necessary Being Argument does not rest on any assumptions about time. But Descartes's SCP clearly *does* rest on at least one assumption about time – namely, that the parts of time are independent of one another. And this assumption is both different from and irreducible to the assumption that every contingent being must have a sufficient cause.

The second problem with reducing SCP to a version of the Necessary Being Argument is simply that Descartes never refers to God as a necessary being in SCP.⁷⁴ And since this concept is central to the Necessary Being Argument, it seems that Descartes would have to use this term if the Necessary Being Argument is indeed what he has in mind.

Third, while reducing SCP to a version of the Necessary Being Argument may help to answer the first two explanatory questions, it fails to answer the third. Assuming that it is the Necessary Being Argument that Descartes has in mind when he gives SCP *would* help to answer the first two explanatory questions. First, it would explain why Descartes thinks that my existing at t cannot cause me to exist at $t + 1$. Because I am a contingent object – or, better, my existing at t is a contingent state of affairs – my existing at t cannot (by itself) be a sufficient cause of my existing at $t + 1$. Second, it would explain why Descartes subscribes to the Counterfactual Assumption. If one accepts the Necessary Being Argument, then it follows that God 'underlies' or 'supports' the causal chain behind A. If God were suddenly to withdraw his support, then A would have no sufficient cause of its continuing to exist at the next moment. So, by PSR, it would cease to exist at the next moment.

But the Necessary Being Argument fails to explain why Descartes identifies continuous (re-)creation and preservation. For even if the chain and therefore everything in the chain depends on God's continued support for its existence, it does not follow from this point that God must continuously (re-)create the chain. It is perfectly consistent with this assumption

⁷⁴Still, Descartes *does* characterize God as a necessary being in other places – primarily in his so-called 'ontological proof' of God's existence in the 'Fifth Meditation' as well as in his replies to objections against his ontological proof.

that God merely 'draw the chain forward' in a continuous, non-(re-)creative fashion. So, again, why does Descartes identify continuous (re-)creation and preservation? Attributing the Necessary Being Argument to Descartes fails to answer this question. And since attributing strong discontinuity to Descartes *does* answer this question, inference to the best explanation suggests that we should accept my argument in section V over Objection 12.

VII. CONCLUSION

In the end, it is difficult to see what other than the hypothesis that Descartes subscribes to strong discontinuity would help to answer – or at least answer with the same degree of explanatory success – all three explanatory questions. And this is the principal point that those who argue against the received view fail to realize and address.⁷⁵

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⁷⁵I would like to thank anonymous referees at *BJHP* for their constructive criticisms; Martha Bolton, Seymour Feldman, Jorge Garcia, Laura Garcia, and Ken Richman for their helpful comments on much earlier drafts of this paper; and Daniel Leonard for his translations of some French texts.

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