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Grounding, infinite regress, and the thomistic cosmological argument

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Abstract

A prominent Thomistic cosmological argument maintains that an infinite regress of causes, which exhibits a certain pattern of ontological dependence among its members, would be vicious and so must terminate in a first member. Interestingly, Jonathan Schaffer offers a similar argument in the contemporary grounding literature for the view called metaphysical foundationalism. I consider the striking similarities between both arguments and conclude that both are unsuccessful for the same reason. I argue this negative result gives us indirect reason to consider metaphysical infinitism as a genuine possibility, the view that chains of ontological dependence or ground can descend indefinitely.

Keywords Grounding · Fundamentality · Infinite regress · Thomistic cosmological argument · Metaphysical infinitism

Introduction

Of Thomas Aquinas' Five Ways, his First Way, the argument from motion, is one of the most hotly contested cosmological arguments to date. Far from being a relic of the past, the argument still enjoys widespread discussion today by many Thomistic philosophers and their critics.[1] Roughly, the idea for Thomas Aquinas is that an infinite chain of causes that exhibits a certain pattern of dependence among its members would be vicious and so must, in actuality, be finite in order to exist at all. While some types of causal series can regress to infinity, Aquinas thinks a certain kind of causal series, one that is essentially ordered, must have a first member that imparts causal efficacy to the series as a whole.

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[1] See Feser (2021), Oppy (2021), Schmid (2021) for recent engagements on this topic.

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But the argument is not just defended and critiqued in the philosophy of religion literature. Interestingly, one finds a similar argument in the grounding literature. As a form of metaphysical determination and dependence, ground is strikingly similar to Aquinas' conception of causation.[2] Jonathan Schaffer's *reality inheritance argument* maintains that an infinite regress of grounding would be vicious and so must ultimately terminate in some entity or entities that are fundamental, a view known as metaphysical foundationalism.

In this paper, I argue that both the Thomistic and reality inheritance arguments are unsuccessful for the same reason. A crucial premise of the Thomistic argument says, roughly, if there is no first cause of an essentially ordered series, there can be no derivative intermediate causes in the series. Similarly, a crucial premise of the reality inheritance arguments says that if a grounding chain has no fundamental source or ground of reality or existence, then there can be no derivative entities. Thomists typically justify their crucial premise by assuming that claiming an essentially ordered series is infinite is equivalent to claiming an essentially ordered series whose primary cause has been removed can nonetheless have derivative causal efficacy. I argue that defenders of the Thomistic argument have failed to offer independent justification for this assumption, and thus, have failed to offer proper justification for the premise. I argue that Schaffer's reality inheritance argument implicitly relies upon a similar assumption and that he too fails to offer independent justification for it. The reality inheritance argument and Thomistic cosmological argument, therefore, suffer the same fate.

The plan for this paper is as follows. In Sect. 2, I introduce the notion of ground in more detail and note its similarity to Aquinas' conception of causation, as understood by contemporary Thomists. Section 3 is a critical engagement with recent attempts in the secondary literature to defend Aquinas's regress argument. In Sect. 4, my focus shifts to Jonathan Schaffer's reality inheritance argument for metaphysical foundationalism. I argue the argument is unsuccessful. In Sect. 5, I conclude by suggesting that the negative results of this paper provide us with indirect reason to consider metaphysical infinitism, the view that ontological dependence or ground can descend indefinitely without ever reaching a level of fundamental entities, as a genuine possibility.

Grounding and thomistic causation

Many metaphysicians today endorse a structured approach to ontology where reality is ordered by relations of metaphysical dependence.[3] For many, ground is the primary notion that plays this structuring role. For my purposes here, I assume

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[2] At various points throughout this paper, I use the terms 'grounding' and 'ontological dependence' interchangeably. I intend to remain neutral regarding the relationship between the two since some thinkers take them to be separate notions. My focus in this paper is on the broad similarities of the Thomistic and reality inheritance arguments. So, I intend my discussion of grounding, ontological dependence, and Thomistic causation to operate at a fairly general level of analysis.

[3] Schaffer (2009), Rosen (2010), Audi (2012).

ground is a relation of metaphysical priority that obtains between facts. In this vein, ground delivers a notion of relative fundamentality in so far as some fact, *f*, is *more fundamental than* another fact, *g*, if *f* grounds *g*.[4] And those facts which are absolutely fundamental, if there are any, and so comprise the fundamental level of reality, are ungrounded.[5] The conception of reality we get is a hierarchical or layered one, where derivative facts are grounded in more fundamental facts, terminating ultimately in a foundational level if there is one, or else descending indefinitely.

A common way to motivate ground is by example. Consider the following typical cases of grounding.

- The fact that John is 5′10″ and brown-eyed is true because John is 5′10″ and John is brown-eyed.
- The set {Socrates} exists because Socrates exists.
- Mary's stealing from John is immoral because it contravenes the Divine law.
- John's pain obtains because of his C-fibers firing.
- The painting is beautiful in virtue of its proportions.

These diverse examples are united by exhibiting some phenomenon holding *in virtue of* some other phenomenon. The first says that conjunctions are true in virtue of each of their conjuncts. The second says that sets exist in virtue of their members. The third says that an action is immoral in virtue of failing to accord with God's commands. The fourth says that mental facts obtain in virtue of neurophysiological facts. And the fifth says that aesthetic properties hold in virtue of non-aesthetic properties.

The cases of ground presented above are also said to be or underlie a metaphysical, as opposed to causal, form of explanation in the sense that they concern the constitutive generation of a dependent outcome.[6] For instance, it is not that the truth of A and B causes A&B to be true. Rather, the relationship is one of constitutive explanation and determination. A grounding explanation is, as Naomi Thompson (2016) puts it, an answer to a "what-makes-it-the-case-that question". For example, we might suggest that what makes it the case that the desk is here is its constituent parts being arranged in the right way. Causal explanations, by contrast, are answers to "why questions". In a causal sense, the desk is here because of the actions of the carpenter who made it, the people who delivered the desk to my house, etc.

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[4] Many understand grounding to relate facts (Audi, 2012; Fine, 2012; Rosen, 2010). But some thinkers understand grounding to relate entities of arbitrary ontological category (Schaffer, 2009). I will confine grounding talk to facts in this paper.

[5] Schaffer (2009).

[6] Schaffer (2017, p. 305). The relationship between ground and explanation is fraught. In this paper, I remain neutral on whether ground just is a form of explanation or otherwise backs explanation. See Raven (2015) for a characterization of these two positions on the relationship between grounding and explanation. He refers to the position that grounding is a form of explanation as *unionism*, and the view that grounding backs or underlies explanation as *separatism*.

Many contemporary grounding theorists think there is something inherently problematic with an infinite regress of grounding.[7] It seems problematic to suggest that some things depend upon other things for their existence ad infinitum without ever reaching something fundamental, a level of facts that are ungrounded yet ground everything else. This view, known as metaphysical foundationalism, holds that ground must be well-founded, that there must be some facts in the order of grounding that are fundamental.[8] Reality must have a foundation, a source of being and a point at which there is no further dependence. As such, the core conception of fundamentality underlying this view is fundamentality as independence. As I mentioned earlier, what it is for x to be absolutely fundamental on a grounding approach is for x to be ungrounded. Like the Aristotelian conception of substance, this notion of fundamentality amounts to a kind of ontological independence.

Both the Thomist and the metaphysical foundationalist think their respective determination relations, causation and grounding, must be well-founded, and for similar reasons too. Both think an infinite regress or non-well-founded chain of dependence would be vicious. However, one might initially think that the Thomistic and the grounding-based arguments are too incongruous. The former is about causation while the latter is about grounding. And ground is a non-causal form of ontological dependence. However, it is important to note that what Thomists find problematic about an infinite regress of causes is the pattern of ontological dependence among the members of the regress. And contemporary Thomists tend to interpret Aquinas' notion of causation in a strikingly similar way to the notion of ground.

Caleb Cohoe argues that for Aquinas, "causation covers any sort of ontological dependence between things: it is primarily a vertical relation, not a horizontal one… Aquinas takes this notion of ontological dependence to be primitive…".[9] Cohoe goes on to note that Aquinas thinks causation, understood in this manner, is asymmetric, irreflexive, and transitive (strict partial order), and that effects are dependent upon their causes in a simultaneous or synchronic sense.[10] Similarly, proponents of ground often construe it as a primitive relation in so far as it cannot be analyzed in terms of other familiar notions, such as supervenience.[11] Many grounding theorists, though not all, take ground to form a strict partial order.[12] And many understand grounding as a "vertical" relation that drives the world up levels rather than across time. As Jonathan Schaffer suggests, "Grounding is something like metaphysical causation. Roughly speaking, just as causation links the world across time, grounding links the world across levels. Grounding connects the more fundamental to the

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[7] See Schaffer (2009, 2010a, 2016), Lowe (1998), Cameron (2008), Bliss (2019).

[8] See Dixon (2016), Rabin and Rabern (2016) for an in-depth discussion of well-foundedness. To be more precise, foundationalism is compatible with infinite chains of ground. What is supposedly problematic is chains of ground that fail to be well-founded or fail to be fully grounded in some fundamental facts.

[9] Cohoe (2013, p. 841–842). Kerr (2012) also argues that Thomistic causation is a relation between *things*, not events (p. 543).

[10] Cohoe (2013, p. 842).

[11] See Schaffer (2009).

[12] See Schaffer (2009), Raven (2013).

less fundamental…".[13] And while many grounding theorist think ground is a relation between facts or propositions, others think ground can relate entities or *things* of arbitrary ontological categories, with virtually no one thinking that grounding relates events.

Furthermore, both grounding theorists and Thomists tend to view their respective relations as productive or generative. In his discussion of Aquinas' regress argument, Gaven Kerr says he is committed to a medieval view about causality as a relation such that the cause has power to bring about an effect whole and complete, which he likens to a form of creation (though presumably in a different sense from God's act of creation ex nihilo).[14] Grounding theorists have a similar view of grounding. Kelly Trogdon writes, "a relation is generative just in case its instantiation brings things into existence. Ground is generative given that grounded entities exist *due to grounding*".[15] Sara Bernstein says, "production does play an implicit role in concepts and elucidations of grounding which take it to be a kind of synchronic generation or 'bringing into existence'. We might consider production to undergird a 'thick' concept of grounding according to which grounders transfer being to their groundees".[16] And for Schaffer, when *x* grounds *y*, *y depends* for its nature and existence upon *x*.[17]

Aquinas' conception of causation certainly looks a lot like ground. However, I am not concerned with exegesis of Aquinas in this paper. Rather, my concern is with the secondary literature on Aquinas' cosmological argument. The infinite causal regress that Thomists find problematic is, like a grounding regress, an in-virtue-of regress. Thomists insist that, in a certain kind of causal regress, each member has its causal capacity in virtue of the previous members. And so, it is not causation per se that is at issue, but the wholly derivative nature of the causal series itself. A similar worry motivates metaphysical foundationalists. If every fact exists in virtue of some further fact ad infinitum, the metaphysical foundationalist worries that in the absence of any fundamental facts, nothing would exist at all. As Schaffer argues, where there is nothing fundamental, "being would be infinitely deferred, never achieved".[18]

With this background in mind, I turn next to an evaluation of the Thomistic cosmological argument in the secondary literature. There, I attempt to isolate the reason why I think the Thomistic argument ultimately fails. Given the striking similarity between the Thomistic and metaphysical foundationalist arguments, I argue subsequently in Sect. 4 that Schaffer's reality inheritance argument is ultimately unsuccessful for the same reason.

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[13] Schaffer (2012, p. 122).

[14] Kerr (2012, p. 543).

[15] Trogdon (2018, p. 189).

[16] Bernstein (2016), p. 24.

[17] Schaffer (2010b, p.345).

[18] Schaffer (2010a, p. 62).

The thomistic cosmological argument

The Thomist makes a distinction between an essentially and accidentally ordered causal series.[19] An accidental series can regress to infinity without any problem, according to the Thomist, because an accidental series supposedly isn't an in-virtue-of regress in the relevant sense. It consists of a series of isolated dependence relations in the sense that any given member of the regress does not depend upon all the preceding members for its causal capacity in the relevant sense. For example, a son can exercise his capacity to beget his own child even if his parents, upon whom he depends for his existence in some sense, ceased to exist. The son's causal capacity is not dependent upon all his ancestors in the relevant sense.

An essentially ordered series, on the other hand, does not consist of a succession of isolated dependence relations. Rather, any given member of the regress will depend upon all the preceding ones for its causal power. Aquinas' classic example is a stone which is pushed by a stick, which is pushed by a hand, which is pushed by the mind.[20] The stick is moving the stone, but the stick is only able to do so in so far as the hand is pushing it. Take away the hand and both the stick and stone lose their capacity for motion. As such, each member of the series is merely an instrumental mover. Thomists think that it would be impossible for an infinite essentially ordered series to exist. It must be finite, terminated by a first member. The idea here is that, if this kind of series regressed forever without a first member that imparts motion to all the rest, each of the instrumental movers in the series would have no motion at all.

It is, therefore, the wholly derivative nature of all the members of the series that Thomists find problematic. And some Thomists will then go on to argue that an essentially ordered series is more fundamental than an accidental series, so that the latter depends upon the former.[21] So, when considering any accidentally ordered causal series, which are the unproblematic kind, we are led to presuppose an essentially ordered series that must have a first member. But why, exactly, do Thomists think that an essentially ordered series must have a first member? That is, what is wrong, exactly, with an infinite series of this sort? In what follows, I'll consider three recent defences of the Thomistic argument. I argue that none provide independent justification for why an infinite essentially ordered series would be problematic.

Gaven Kerr

Gaven Kerr offers the following argument. Keep in mind that Kerr is not using the term 'one-many' here in the typical sense to denote the arity of a relation. Rather, a one-many relation for Kerr is one "whereby some cause, x, on which a given effect,

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[19] Though the terminology of 'essentially' and 'accidentally' ordered is not found in Aquinas himself, it fits with the secondary literature and is simply meant to refer to Aquinas' original distinction. See *ST*, I, q. 46, a. 2, ad 7.

[20] *ST*, I, q. 46, a. 2, ad 7.

[21] Feser (2021 p. 514).

y, depends is not only itself dependent on some antecedent cause, w, but cannot be understood to be a cause of y without the causal activity of w".[22] It is just the term Kerr uses for an essentially ordered series.

> (*i*) in a one-many series the causes are causally inefficacious without some primary cause on which the causal efficacy of the series depends and which naturally terminates the series, and (*ii*) in an infinite series there is no primary, naturally terminating, cause, in which case there is no cause for the causal efficacy of the series. Thus, a believer in an infinite series of one-many causal relations denies any causal efficacy to that series, in which case he or she denies the possibility of that series precisely as a causal series.[23]

Kerr offers the typical example we saw above to illustrate an essentially ordered series, "a stone (z) is moved by a stick (y) which is moved by a hand (x) which is moved by the mind (w)".[24] He offers the following formulation, which I label 'ES'.

$$ES : (w \rightarrow (x \rightarrow (y \rightarrow z))).$$

Kerr contrasts this case with the other typical example of an accidentally ordered series, which I label 'AS', "a son, z, is begotten by his father, y, who is begotten by his father, x, who is begotten by his father, w, and so on", formulated as follows,[25]

$$AS : (\ldots) \rightarrow (w \rightarrow x) \rightarrow (x \rightarrow y) \rightarrow (y \rightarrow z).$$

The parenthetical formulations are supposed to illustrate how each member of the essentially ordered series cannot be understood in isolation from the others. We can reformulate Kerr's argument as follows

1. All essentially ordered causal series lacking a primary cause lack causal efficacy.
2. All infinitely regressing essentially ordered causal series lack a primary cause.
3. Therefore, all infinitely regressing essentially ordered causal series lack causal efficacy.

The argument is valid. However, my primary concern is with premise 1. Kerr is certainly right that an infinite series lacks a primary cause, where a primary cause is one that doesn't derive its causal efficacy from anything else. But it remains to be seen why an infinite series would thereby also lack causal efficacy. What reason does Kerr provide for thinking this?

With reference to ES above, Kerr argues that in an essentially ordered series, unlike with an accidentally ordered series, "The causal activity of y with regard to z cannot be isolated from the more encompassing causal activity of x, which in turn cannot be isolated from the even more encompassing causal activity of w".[26]

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[22] Kerr (2012, p. 545).

[23] Kerr (2012 p. 550).

[24] Kerr (2012, p. 545).

[25] Kerr (2012, p. 545).

[26] Kerr (2012, p. 546).

So, the example shows that if we isolate the members of the series from their primary cause—the mind—by removing it from the series, the rest of the members will possess no causal power. In other words, any given member isolated from its prior causes will lack causal efficacy. Brian Davies points this out as well in his summary of Aquinas' argument, noting that "In 'an ordered' series of movers and things moved, if the first mover is 'removed or ceases to move' no other mover will move or be moved".[27]

However, it is somewhat banal to note that if you remove the cause you thereby also remove the effect. This is to simply point out the standard counterfactual dependence that many think is somehow involved with causation. As David Lewis argued,

> We think of a cause as something that makes a difference, and the difference it makes must be a difference from what would have happened without it. Had it been absent, its effects – some of them, at least, and usually all – would have been absent as well.[28]

And like the Thomistic conception of ontological dependence, counterfactual dependence has been thought by some to be transitive, though this is a controversial assumption. Regardless, even barring a successful attempt to analyze causation exclusively in terms of counterfactual dependence, which many reject today, most still think counterfactual dependence is somehow intimately involved in analyses of causation.[29] So, Kerr's point is well-taken.

Nonetheless, Kerr concludes from this point that, if there is no primary cause, no member of the series has causal efficacy. He says, "to deny a primary cause to the one-many series, i.e., to affirm the possibility of an infinite series, is precisely to remove the causal efficacy of the causes within the series…".[30] But this is precisely what Kerr has not demonstrated. Kerr is assuming that affirming that the series is infinite is equivalent to claiming that we can remove the mind from Aquinas' stick/stone example while still maintaining that the rest of the series has causal activity. But these are entirely different claims. I agree with Kerr that if an essentially ordered series terminates in a primary cause, as in the stick/stone example, and we then remove the primary cause from the series—the mind—then everything that is causally down stream of that primary cause will lack causal efficacy. Tracing the series backwards from the stone, we will arrive at the stick, which itself has no causal efficacy either in a derived or underived manner, and so can impart no causal efficacy to all the rest. This would be problematic.

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[27] Davis (2016, p. 41).

[28] Lewis (1973, p. 161).

[29] For example, see Ned Hall (2014) for a counterfactual and productive account of causation. See also Pearl (2000) for the structural equation approach to causation.

[30] Kerr (2012, p. 550).

But if an essentially ordered series is infinite, then no matter how far back in the series we go, so to speak, we will never arrive at a member whose causal efficacy is neither derived nor underived as we do with the stick/stone example whose primary cause, i.e., the mind, has been removed. But this is the very reason the Thomist rejects infinite essentially ordered series. When we remove the primary cause from an essentially ordered series, we are forced to maintain that a series of causes ultimately depends upon a member that has neither derived nor underived causal efficacy, which is problematic. But if the series is infinite, there is no such problem and, thus, no pressure to conclude that such infinite series are impossible. Kerr is certainly correct that claiming that the series is infinite amounts to a denial of a primary cause, but it is not a denial via removal of a primary cause from an essentially ordered series. What Kerr needs to show is that *removing a primary cause* from an essentially ordered series and *affirming that the series is infinite* are equivalent claims. Until Kerr shows this, the proponent of an infinite essentially series is left with no good reason to think an infinite essentially ordered series lacks causal efficacy entirely. And I don't take myself to have the burden of showing that there exists an essentially orders series where no member has its causal power non-derivatively because I am arguing merely for its possibility in this paper, not its actuality.

Caleb Cohoe

Caleb Cohoe offers the following argument for why an essentially orders series must have a first member.

> Each member of the series either has the causal power it is exercising derivatively or non-derivatively. If the series has no first independent member, then no member has the power it is exercising non-derivatively. In consequence, none of the members can have causal powers derivatively, since there is no member from which this power could be derived. There would be no ground or source for the causal power the member receives.[31]

Cohoe infers that no member could have any derivative causal power if there were no ultimate or first member from which this power is derived. We can offer the following reformulation of Cohoe's argument.

1. If there is no first member of the essentially order causal series, then all members of the essentially order causal series have their causal power derivatively.
2. If all members of the essentially order causal series have their causal power derivatively, then none have it non-derivatively.
3. If no members of the essentially order causal series have their causal power non-derivatively, then no members can have their causal power derivatively.
4. Therefore, if there is no first member of the essentially order causal series, then no members can have their causal power derivatively.

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[31] Cohoe (2013, p. 848).

Cohoe's argument, thus formulated, is valid. I grant premises 1 and 2 but find premise 3 problematic. Premise 3 is similar to Kerr's first premise in the previous section. Both maintain that in the absence of a primary cause no member of the series will have any causal efficacy derivatively.

Unfortunately, Cohoe doesn't seem to offer any independent justification for premise 3. But he does make several suggestions. For example, Cohoe argues, "The wholly derivative nature of these series is the principal reason that each must have a first and independent member. You cannot give what you do not have".[32] This suggestion that you cannot give what you do not have sounds promising. At least in our everyday experience, we would be puzzled to find out that there is a series of borrowers and lenders but no initial source of any sum of money that allows them to lend and borrow in the first place (I'll discuss this example further in Sect. 4). But if Cohoe is assuming that, in the case of a genuinely infinite essentially ordered series, no member of the series would have causal efficacy to give to any posterior member, then the suggestion seems problematic for the same reason we saw in Kerr's argument. Cohoe suggests, "If there is no first cause, the intermediate causes will not be caused since they depend on the first for their causal powers. There would then be no cause to account for the effect that is observed".[33] I grant Cohoe that if there is an essentially ordered series that terminates in a primary cause, and we then remove the primary cause from the series, the rest of the series will lack causal efficacy. But affirming that the series is infinite is not to claim that an essentially ordered series whose primary cause has been removed can still have causal efficacy. Those just aren't the same claims. Cohoe, like Kerr, needs to show that they are.

Cohoe also appeals to two common analogies to motivate premise 3 of his argument, namely, an endless series of rings and an endless series of train cars. He writes,

> Knowing that a ring is held up by the previous ring or that a train car is pulled by the previous one does not on its own establish whether the ring can be held up or whether the train car is moving, because the previous members in these cases are intermediate members. An infinite series of intermediate members gets one no closer to resolution than a finite series does: both need a first, non-derivative member.[34]

I take it Cohoe is suggesting that if we came upon a moving train and were told it lacked an engine but that, nevertheless, each train car being pulled by the previous one was sufficient to account for the motion of the whole, we would think this impossible. Edward Feser makes the same point. He writes,

> The point is that secondary [instrumental or derivative] causes would lack efficacy without a primary cause. For example, a railroad boxcar cannot move on its own and without an engine, and neither can a finite series of boxcars, nor an

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[32] Cohoe (2013, p. 848).

[33] Cohoe (2013, p. 848).

[34] Cohoe (2013, p. 851).

infinite series of boxcars, nor a series of boxcars that loops around on itself to form a circle.[35]

And the fierce critic J.L Mackie admitted that there is an apparent coherent thought or intuitive general principle behind these sorts of cases that are intended to motivate the Thomistic argument, though I disagree with him. Mackie says,

> If we were told that there was a watch without a mainspring we would hardly be reassured by the further information that it had, however, an infinite train of gear-wheels. Nor would we expect a railway train consisting of an infinite number of carriages, the last pulled along by the second last, the second last pulled by the third last, and so on, to get along without an engine… There is here an implicit appeal to the following general principle: Where items are ordered by a relation of dependence, the regress must end somewhere; it cannot be either infinite or circular.[36]

However, it is important to note here that these examples and analogies offered by Cohoe, Feser, and Mackie, at most, function as intuition pumps that are meant to motivate accepting the crucial premise of the Thomistic argument. But it seems to me the analogies provided are just too disanalogous with the case of infinite causal chains and too disputable to do any serious work in motivating the Thomistic argument. As such, these sorts of intuition pumps are unlikely to be persuasive to anyone who is not already convinced of the conclusion they are meant to support.[37] To see why, let's briefly look at the train analogy in a little more detail.

In Mackie's quote above, the infinite train seems to already be in motion, and we are told that it lacks an engine. We find this absurd primarily because we already have a prior knowledge that trains cannot move without an engine and so must, in fact have an engine. But this analogy doesn't do much work to motivate the crucial premise of the Thomistic argument. For in the case of a causal series, we do not have a prior knowledge that the series of causes "must have an engine", i.e., must have a first member. To assume so would beg the question. And to base the assumption that we do have such prior knowledge in the case of the causal series upon the further assumption that an engine-less train and an infinite causal series are sufficiently similar seems unmotivated to me. So, it is unclear to me how Mackie's suggestion is supposed to help the Thomist.

We might read Feser's example as suggesting that the train is infinite in length and lacking an engine but not presently in motion. Of course, the train will never be set in motion without an engine. But what is this supposed to show regarding an infinite essentially ordered series? This example is simply too disanalogous with an infinite series of causes because when we go out into the world and observe it, we find a world in which things are already "in motion", so to speak, and subject to causation, not one that is at rest. Perhaps Feser's point is more like Mackie's, that

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[35] Feser (2021, p. 517).

[36] Mackie (1982, p. 220).

[37] Thanks to an anonymous referee for this point.

given the train cannot move without an engine, if we *were* to find a moving train and were told it was infinite in length and had no engine, we would know that this could not be the case and would have to infer that there was, in fact, a "first member", an engine moving the train. But, again, this would just be question-begging for the reason given in the previous paragraph. Therefore, it seems to me that the infinite train analogy does little work in supporting Cohoe's argument.

At this point, the Thomist might respond by highlighting the difference between an essentially and accidentally ordered series, or what Edward Feser terms a linear and hierarchical series, respectively. Feser says, "Because the later members of a linear series do not depend on the earlier members in the way the secondary members of a hierarchical series depend on its primary member, a linear series need not trace back to a 'first' cause in the relevant sense".[38] This strategy in responding to critics has merit if the objector fails to understand Aquinas' distinction between an accidentally and essentially ordered series and his claim that only that latter cannot be infinite. For example, Feser accuses Graham Oppy (2006) of making this mistake.[39] However, I want to emphasize that Feser's strategy of highlighting the sort of dependence operative in an essentially ordered causal series does nothing to answer my objection because my objection takes this into account. I acknowledge the distinction between an essentially and accidentally ordered series and, again, grant that a finite essentially ordered series must have a first member or cause. My objection is that the Thomist has *not* shown that affirming that an essentially ordered series is infinite is equivalent to removing the primary cause of a finite essentially ordered series whilst maintaining that very series still has causal efficacy.

Cohoe offers one further line of justification for premise 3 of his argument above, which involves elucidating a different analogy offered by John Haldane. Though unsuccessful, I want to briefly discuss Haldane's analogy in its own right in order to show how common I think the mistake being made here is on the part of Thomists. Haldane's analogy also nicely parallels the analogy Schaffer gives to justify his reality inheritance argument, which I discuss in Sect. 4.

John Haldane

Let's consider an example that John Haldane appeals to in order to motivate why an infinite series of essentially ordered series is problematic. Haldane relates an event when The University of St. Andrews decided to start a "progress review" system for faculty and staff. The terms of the review stated that "the reviews of colleagues who

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[38] Feser (2021, p. 512).

[39] Feser (2021) writes, "First, when Aquinas judges that an infinite regress of causes is impossible, he is talking about causal series of the kind that I characterized above as *hierarchical* rather than *linear*, and the reasons for his judgement are the same as those I summarized when discussing this distinction. This is a point often emphasized in Thomistic discussions of the Five Ways, but Oppy appears not to be aware of it. At a couple of places in his discussion he remarks that Big Bang cosmology need not be interpreted in a way that rules out an infinite regress of causes, which indicates that he is making the exegetical mistake of supposing that Aquinas is concerned with linear causal series extending backward in time" (p. 516).

have not been reviewed previously but are to act as reviewers will also have to be arranged…so that all reviewers can be reviewed before they review others".[40] As a result, no individual can be a reviewer until he or she has first been reviewed. Each person, therefore, has their ability to review only in a derivative manner. Haldane notes that the process could not get started, given these terms. The University realized the problem and designated one of the senior administrators as an unreviewed reviewer to get the process going.[41]

Haldane's example illustrates the same problem we've seen above. The sorts of examples or analogies provided at best establish the need for a primary cause for a *finite* series but not necessarily for an infinite series. Kai Nielson puts this point nicely.

> Only if the series were finite would it be impossible for there to be something if there were no first cause or uncaused cause. But if the series were literally infinite, there would be no need for there to be a first cause to get the causal order started, for there would always be a causal order since an infinite series can have no first member.[42]

There is a need for a first member in Haldane's scenario, an unreviewed reviewer, but only because the series in question is finite. Given a finite set of individuals serving as reviewers and the rule that all reviewers must first be reviewed before they review anyone else, the review process will not get started. In order to get started, one of the persons involved must have her reviewer status in an underived manner. However, we cannot then infer without further argument that this is true if the series were infinite for the same reasons we've already seen above. Haldane's implicit assumption seems to be that affirming that the series is infinite is akin to saying that the finite series of reviewers have "causal efficacy", i.e., are able to review each other, even though they lack a first member—an unreviewed reviewer—to get the process going. And we've already seen why this assumption is unwarranted. If the series were infinite, we would never arrive at a reviewer who neither has her reviewer status in a derived or underived manner, which is what makes Haldane's case problematic to begin with.

Presumably, the purpose of Haldane's example here, and perhaps also the case of the infinite train in the previous section, is to illustrate the alleged inconceivability of an actual causal series with no member whose agency is underived. But what I've been trying to show is that such cases really aren't as problematic as proponents of the Thomistic cosmological argument take them to be. We might, of course, simply reject any link between conceivability and metaphysical possibility. But regardless,

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[40] Smart and Haldane (1996, pp. 129–31).

[41] Smart and Haldane (1996, pp. 129–31).

[42] Nielson (1971, p. 171). Mackie (1982) levels a similar complaint against Aquinas. He writes, "In fact, Aquinas has simply begged the question against an infinite regress of causes" (p. 220). Similarly, Paul Edwards also makes this complaint against the Thomist. A finite series of books, each stacked one upon the other, would surely come crashing down without a 'first book' that acts to hold all the rest up. As Edwards says, "if the series, however, were infinite this would not be the case. In that event every member *would* have a predecessor to support itself on and there would be no crash" (1959, p. 206).

I've argued that the apparent inconceivability of an infinite essentially ordered series rests upon an unfounded assumption, namely, that affirming that such a series is infinite is equivalent to removing the primary cause of an essentially ordered series while maintaining the series still has causal efficacy. We've seen no reason to accept this assumption, which I believe gives us indirect evidence for the possibility of infinite chains of dependence.

The reality inheritance argument

I now want to shift my focus to the reality inheritance argument for metaphysical foundationalism and show that this argument is problematic for similar reasons as the Thomistic cosmological argument. Some thinkers employ the notion of reality inheritance to argue that non-well-founded chains of ground are problematic. When *x* grounds *y*, *y* supposedly inherits its reality or existence from *x* so that *y* exists in virtue of *x*. The idea is that if there is a regress of grounding, where each fact inherits its existence from some further fact, there must be a source of that existence in the first place. As Schaffer argues, "There must be a ground of being. If one thing exists only *in virtue* of another, then there must be something from which the reality of the derivative entities ultimately derives".[43] By a "source" Schaffer means a fundamental ungrounded fact that does not inherit its existence from anywhere else.

The main idea for Schaffer is that where there is nothing fundamental, "being would be infinitely deferred, never achieved".[44] By "never achieved", we might plausibly take Schaffer to mean that being or existence never gets off the ground in the first place, that nothing would exist at all. Without a fundamental ground, so the argument goes, there would be nothing in the world that *makes it the case*, i.e., that grounds or explains, that anything exists in the first place. Kelly Trogdon construes the argument in the following manner.

1. *The reality inheritance premise* if A is non-fundamental then A inherits its reality from whatever fully grounds it.
2. *The source of reality premise* necessarily, if A inherits its reality then there are Δ that are the source of A's reality.
3. *The reality/fundamentality premise* necessarily, if Δ are a source of A's reality then the entities among Δ are fundamental and Δ fully ground A.[45]

As I noted earlier, many grounding theorists tend to think of ground as a productive relation, one in which the grounding facts produce or generate the existence of the grounded facts. So, premise 1 is a fairly reasonable assumption, though not

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[43] Schaffer (2010a, p. 37). Lowe (1998) also argues, "…in the absence of any primitive substances, it appears, no other concrete objects could exist at all, including even places and times" (p. 171).
[44] Schaffer (2010a, p. 62).
[45] Trogdon (2018, p. 185).

completely uncontested.[46] Premise 2, then, is the most crucial premise of the argument and bears a strong resemblance to the crucial premise in the Thomistic argument, which said that without a primary cause, there can be no derivative causes. To see the resemblance, consider that if we perform modus tollens on premise 2, then it would be false that some fact, A, inherits its reality or existence. As such, A would not be grounded, and so would not exist. Thus, we could rephrase premise 2 above to say, "without a fundamental fact there can be no derivative facts", analogous to the crucial premise in the Thomistic argument.

To motivate premise 2, proponents offer analogies with finite chains of transference that undoubtedly require a fundamental source and then extrapolate to the case of infinite chains of grounding in order to show that there must be a source in this case as well. Schaffer writes,

> Grounding must be well-founded because a grounded entity inherits its reality from its grounds, and where there is inheritance there must be a source. One cannot be rich merely by having a limitless sequence of debtors, each borrowing from the one before. There must actually be a *source* of money somewhere. Likewise something cannot be real merely by having a limitless sequence of ancestors, each claiming reality from its parents. There must actually be a source of reality somewhere. Just as wealth endlessly borrowed is never achieved, so reality endlessly dependent is never realized.[47]

I think Schaffer's justification here for premise 2 goes wrong for the same reasons we've already seen above with the Thomistic argument. Let's flesh this out a little more first. Suppose we have the rule that any given person can be rich only if they inherit or borrow their wealth from someone else. And suppose the chain of lenders is finite; x lends to y and y lends to z, so that z is rich. But given that there was no one who lent money to x, and our rule that any given person can be rich only by borrowing wealth, it then turns out that there is no source from which z actually acquired their wealth in the first place. So, the finite series tells us that wealth inheritance requires an unborrowed or uninherited source of wealth. X must have acquired their wealth by some means other than inheritance, by investing in the stock market, say.

But what is wrong with the series being infinite? I think Schaffer is implicitly relying upon the same assumption that the Thomist thinkers in the previous section make.[48] That is, it seems Schaffer is assuming that if we maintain the series is infinite in length, this is akin to claiming that our finite series of borrowers and

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[46] Paul Audi (2012, pp. 798–709) seems to reject this notion of grounding, arguing that grounding is not a link between degrees or levels of reality. Additionally, one who endorses the operational view of ground, where statements of ground are expressed by use of a sentential connective rather than a relational predicate, will not conceive of grounding as a productive relation.

[47] Schaffer (2016, p. 95).

[48] Jacek Brzozowski (2008) offers an almost identical argument, which to my mind makes the same mistake. He argues, "Let us suppose that someone is royal only in virtue of their father being royal, and never in virtue of anything else. Then if there is only a finite series of people, no one is royal. And even if there is an infinite series, still no one is royal. In effect, there is nothing in the world that makes it the case that someone is royal in the first place, rather than no one being royal" (p. 201).

lenders—*x, y,* and *z*—can still lend each other money even if there is no member of the series who acts as an uninherited source of wealth. But, as I have argued above, claiming that the series in question is infinite is not equivalent to removing a primary cause from a finite essentially ordered series. If the chain of wealth transference is infinite, we never reach an end of the chain where someone neither has wealth in a derived nor underived manner, which is precisely what leads us to believe there must be an unborrowed or uninherited source to begin with in the finite case.

It's unclear, then, just how considerations of wealth inheritance are supposed to motivate the well-foundedness of ground. The reality inheritance argument, therefore, seems to suffer the same fate as the Thomistic cosmological argument and for similar reasons. This is not to say that the argument is unsalvageable. But it's difficult to see what further independent and non-question-begging reason we could give for thinking that premise 2 of the reality inheritance argument is true.

Metaphysical infinitism

We've seen that the Thomistic argument and the reality inheritance argument are sufficiently similar to merit comparison. Both appeal to a similar notion of ground or ontological dependence. Both find an infinite regress of grounding or ontological dependence problematic. And both arguments attempt to establish the existence of something fundamental, something that terminates the series of dependence and acts as the fundamental ground for all the derivative members of the series. Nonetheless, we've struggled to find convincing justification for the crucial premises of both arguments. Both arguments go wrong for the same reason. Where does this leave us?

The alternative position I've been indirectly advocating for in this paper is one that allows for the possibility of infinite or non-well-founded chains of ground or ontological dependence of the sort that Thomists and metaphysical foundationalists find problematic. On this view, sometimes called metaphysical infinitism, chains of ground can descend indefinitely without terminating in some fundamental facts.[49] The infinitist endorses ground as a strict partial order that obtains between facts but simply denies that it must be well-founded. I suspect the Thomist's and metaphysical foundationalist's rejection of this view stems, in part, from an aversion to the idea that *everything* is dependent or derivative. The idea has long plagued foundationalists and theists alike. For example, the rationalist Samuel Clarke argued that,

> To suppose an infinite series of changeable and dependent beings produced one from another in an endless progression, without any original cause at all,

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[49] Prominent discussions of metaphysical infinitism include Schaffer (2003), Tahko (2014), Raven (2016), Morganti (2014, 2015, 2018), Bohn (2018). Another alternative position is called metaphysical coherentism or holism, the idea that grounding can form loops or cycles. See Bliss (2014), Thompson (2016), Morganti (2018) for discussions of this view. See Cameron (2022) for a defence of both views.

is only pushing out of sight the question about the ground or reason for the existence of things.[50]

More recently, E.J. Lowe says he finds the "vertiginous implications" of a denial of metaphysical foundationalism "barely comprehensible".[51] And Cohoe maintains that if there were no first fundamental or independent cause, "There would be ontologically dependent entities with nothing on which to depend. This is impossible".[52]

One way to construe these concerns is to suggest that existence of a dependent reality somehow presupposes the existence of an independent reality. John Searle makes this kind of argument against social constructivism that equally applies to our discussion here. He says,

> a socially constructed reality presupposes a reality independent of all social constructions, because there has to be something for the construction to be constructed out of. To construct money, property, and language, for example, there have to be raw materials of bits of metal, paper, land, sounds, and marks, for example. And the raw materials cannot in turn be socially constructed without presupposing some even rawer materials out of which they are constructed, until eventually we reach a bedrock of brute physical phenomena independent of all representations.[53]

Searle's worry is a conceptual one, that admitting a constructed reality presupposes an unconstructed reality. Similarly, we might worry that admitting the existence of a dependent reality simply presupposes the existence of an independent reality to begin with! If so, then Cohoe would be right in thinking that it would be impossible for dependent entities to exist without anything independent for them to depend upon.

However, I think this worry is misplaced. Both Cohoe and Searle are right in thinking that a dependent or constructed reality presupposes some further reality upon which it depends or is constructed out of, respectively. But why, exactly, must there be an independent reality that acts as a foundation for all of it? The implicit assumption here is that if there weren't some independent or fundamental reality, a problematic infinite regress would ensue. But this just brings us back to our starting point. If the regress is problematic, then the Thomist and metaphysical foundationalist need to show us why.[54] As we've seen in this paper, that is precisely what they have failed to do.

Alternatively, there might be competing intuitions at play here regarding the nature of explanation as it functions within foundationalist and infinitist ontologies, respectively. Throughout this paper, I've primarily emphasized the determinative aspect of ground and ontological dependence. But many think these relations have an explanatory aspect as well. As I noted above in Sect. 2, ground is

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[50] Clarke, *A Demonstration of the Being and Attributes of God*, Sect. 2, p. 7. Retrieved from, https://earlymoderntexts.com/assets/pdfs/clarke1704.pdf. July 11, 2022.

[51] Lowe (1998, p. 158).

[52] Cohoe (2013, p. 840).

[53] Searle (1995, pp. 190–1).

[54] Westerhoff (2020, p. 168) makes a similar critique of Searle.

typically associated with a distinctive kind of non-causal metaphysical explanation. However, I am unsure of the extent to which adherents of Aquinas consider their respective notion of ontological dependence to be explanatory. Kerr talks about the causal dependence relation in question in explanatory terms.[55] And Cohoe says that Aquinas would consider ontological dependence and causation to be distinct, the former being metaphysical or determinative, the latter being explanatory.[56] So, it is unclear to me whether the Thomist's dependence regress is, strictly speaking, also an explanatory regress.

Regardless, as we can see from the quote above, Clarke seems to find infinite explanations problematic because they leave something unexplained. What, exactly, is left unexplained is unclear. He says only that the reason for the "existence of things" is unaccounted for. But the infinitist disagrees, arguing that in so far as each fact is grounded in some further fact, ad infinitum, everything that needs to be explained is explained. This sort of response is, of course, reminiscent of David Hume's response to the cosmological argument.[57] A further question then, which I can't address here, is whether the defender of the Thomistic argument has more of the Clarke-Leibniz conception of the cosmological argument in mind, where infinite chains of dependence/explanation are problematic because they exhibit a kind of explanatory failure. But if the defender of the Thomistic argument insists that the regress in question is not vicious for *explanatory* reasons, then it's unclear to me how the regress is vicious after all.

Conclusion

We've seen at least indirect evidence for metaphysical infinitism in this paper by showing that the Thomistic and reality inheritance arguments are unsuccessful. All this is not to say that infinite regresses of ontological dependence or grounding aren't problematic for some other reason or that metaphysical infinitism is actually true.[58] It is only to say that Thomists and metaphysical foundationalist have hitherto failed to provide convincing reasons to think infinite regresses of the sort under consideration here are problematic. Once we've recovered from our vertigo after staring

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[55] Kerr writes, "it follows from this view that the explanatory force that goes along with positing the causal relation is based upon the fact that there is a real connection between two things, cause and effect, such that one cannot understand the existence of the latter without the former" (p. 544).

[56] Cohoe (2013, p. 842).

[57] Hume argues, "Also: in such a chain or series of items, each part is caused by the part that preceded it, and causes the one that follows. So where is the difficulty? But the *whole* needs a cause! you say. I answer that the uniting of these parts into a whole, like the uniting of several distinct counties into one kingdom, or several distinct members into one organic body, is performed merely by an arbitrary act of the mind and has no influence on the nature of things. If I showed you the particular causes of each individual in a collection of twenty particles of matter, I would think it very unreasonable if you then asked me what was the cause of the whole twenty. The cause of the whole is sufficiently explained by explaining the cause of the parts" David Hume, Dialogue Concerning Natural Religion (1779), Part IX.

[58] See chapters 1 and 3 of Cameron (2022), wherein he develops a plausible take on the viciousness of an infinite regress of ontological dependence that is not unlike Aquinas'.

down the indefinitely descending hierarchy of dependent beings, I think it's clear that some form of metaphysical infinitism is not as problematic as it might at first seem. Therefore, I think metaphysical infinitism merits being considered as a genuine possibility.[59]

Declarations

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