

There Must Be A First:

Why Thomas Aquinas Rejects Infinite, Essentially Ordered, Causal Series

Abstract

Several of Thomas Aquinas's proofs for the existence of God rely on the claim that causal series cannot proceed in infinitum. I argue that Aquinas has good reason to hold this claim given his conception of causation. Because he holds that effects are ontologically dependent on their causes he holds that the relevant causal series are *wholly* derivative: the later members of such series serve as causes *only* insofar as they have been caused by and are effects of earlier members. Because the intermediate causes in such series possess causal powers only by deriving them from *all* the preceding causes, they need a first and non-derivative cause to serve as the source of their causal powers.

Keywords

Thomas Aquinas; Five Ways; Causal Series; Infinite; Causal Regress; Causation; Ontological Dependence; God; Proofs

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A. Introduction

Thomas Aquinas claims that certain sorts of causal series cannot proceed *in infinitum*. This claim is central to the first three of the famous five ways for demonstrating the existence of God that he presents in his *Summa Theologiae* (*ST*). Many interpreters have attacked both the claim and the considerations which Aquinas offers in support of it. Some interpreters, such as Bertrand Russell and John Hick, read Aquinas either as negligently dismissing the possibility of infinite series without a first member or as assuming a rejection of the infinite, based on certain (supposedly dubious) arguments that Aquinas puts forward elsewhere.¹ Other interpreters, including distinguished scholars

¹ Bertrand Russell writes that the Five Ways “depend on the supposed impossibility of a series having no first term. Every mathematician knows that there is no such impossibility: the series of negative integers ending with minus one is an instance to the contrary.” (Russell 1969, 453) Hick objects to Aquinas

of the philosophy of religion, such as William Rowe, and even scholars who specialize in Aquinas, such as Anthony Kenny, recognize that Aquinas does not have a problem with all infinite series but claim that Aquinas does not offer a cogent argument that the sort of causal series he considers must have a first, independent member.² Aquinas effectively assumes that these sorts of series must have such a first member without offering any plausible considerations for this claim. A number of philosophers have defended Aquinas's claim that such series must have a first member.³ Nevertheless, many scholars still do not understand why Aquinas insists that the causal series found in the first three ways cannot proceed *in infinitum*, largely because there is a lack of consensus about the reasons for his insistence. Does Aquinas's rejection of these infinite causal series stem from his suspicion of the infinite, his views on causation, or other metaphysical commitments? Norman Kretzmann, for instance, defends Aquinas's rejection but claims that it rests on a moderate version of the principle of sufficient reason (PSR).⁴

In this paper I aim to show precisely why Aquinas rejects infinite causal series. To do this, I examine Aquinas's proofs in their broader metaphysical context. I begin by presenting Aquinas's understanding of causality. I argue that ontological dependence is

by stating that "it is perfectly conceivable that time has no beginning, and that every event was preceded by an earlier event." (Hick 1990, 20) Hick notes in a footnote that Aquinas holds in the very same work that there is no impossibility to time being without a beginning, but he is still not attentive to the actual argument Aquinas gives.

² Kenny alleges that Aquinas either illicitly shifts the meaning of "first", "*primum*", in the course of his arguments, going from taking *primum* to mean earlier to taking it to mean absolutely first and independent, or simply assumes what he is trying to prove. (Kenny 2003, 26-7) Rowe and Mackie take Aquinas to be assuming what he is trying to prove, (Rowe 1975, 18-19 and Mackie 2000, 220) though Rowe then looks at Aquinas's discussion of infinite series in other places and tries to formulate an argument on behalf of Aquinas, as does Mackie. (Rowe 1975, 22-37; Mackie 220-1) C.J.F. Williams attacks Aquinas along similar lines. (Williams 1960)

³ Owens 1962; Brown 1976; Craig 1980 173-4, 179-80; Day 1987; Smart and Haldane, 129-31, 135-6; Kretzmann 1997, 98-108; Wippel 2000, 421-4, 436-7, 447-8, 460-1; Dewan 2001.

⁴ Kretzmann 1997, 105-8. Rowe's attempted reformulation of Aquinas also relies on the PSR. (Rowe 1975, 37-9, 45-6)

central to Aquinas's notion of causality.⁵ The ontological dependence of effects upon their causes allows Aquinas to offer cogent reasons for holding that the causal series under consideration in the first three ways must each have a first, ontologically independent member.

These infinite series are what I call *essentially ordered causal series*.⁶ An essentially ordered causal series is asymmetric, irreflexive, and *wholly* derivative. The subsequent members in such series are not only caused by and ontologically dependent on the preceding members, as in a transitive series, they also serve as causes *only* insofar as they have been caused by and are effects of *all* the preceding members. Because these intermediate causes possess causal powers only by deriving them from all the preceding causes, they need a first and non-derivative cause.⁷ Something can have a causal power derivatively only if that causal power can, in fact, be derived from something else. If there were only intermediate and derivative causes, then there would be no source from which the causal powers of the intermediate causes could be derived, regardless of whether there were a finite or infinite number of intermediate causes. If there were no first, non-derivative cause, the intermediate causes would not actually be causes and the

⁵ Aquinas's account of causality is therefore closer to contemporary theories of ontological dependence than it is to the predominant contemporary theories of causality.

⁶ This terminology is not explicitly found in Aquinas but fits well with his understanding of these causal series and also accords with extant secondary literature (e.g. Kerr 2012). In the five ways Aquinas describes such series as "ordered," *ordinata*, where he is evidently speaking of an intrinsic and essential order, not some incidental order. In *ST Ia.46.2, Ad Septimum*, Aquinas claims that infinite essentially ordered causal series require an infinite number of causes *per se* while what I will call accidentally ordered causal series only require an infinite number of causes *per accidens*. Thus for Aquinas the distinction between different causal series is of the *per se/per accidens* variety. The specific terminology is found in John Duns Scotus who distinguishes between causes that are ordered essentially and through themselves, "essentialiter et per se" and those that are only ordered incidentally, "accidentaliter." (Duns Scotus 1982 3.11) I am using this terminology to explicate Aquinas's views, not Scotus's, so my use does not signal either a commitment to all of Scotus's claims about such series or a claim that the views of Scotus and Aquinas in this area are the same.

⁷ In contrast, causal series that are not wholly derivative can proceed *in infinitum* because there is no need for these series to have a first member, since each member directly depends *only* on the previous member.

effects observed in the first three ways would lack a cause capable of producing them. There would be ontologically dependent entities with nothing on which to depend. This is impossible.

On my interpretation, Aquinas's claim that essentially ordered causal series cannot go on *in infinitum* does not rely on the PSR or some version of it.⁸ It also does not rely on the claim that infinite series are impossible or on the claim that a causal series, considered as a whole, must have a cause over and above the causes of its parts.⁹ Aquinas merely claims that an effect, insofar as it is an effect, must have a cause capable of producing it. If Aquinas's other premises are sound, then his denial of infinite essentially ordered causal series is sound.

B. Aquinas on Causation and Ontological Dependence

Aquinas's conception of causation is much broader than typical contemporary conceptions of causation. On the predominant contemporary conception causation is seen as a one-one relation between events, with the event that is the cause being temporally prior to the event that is the effect. For Aquinas, in contrast, causation covers any sort of ontological dependence between things: it is primarily a vertical relation, not a horizontal one.¹⁰ In his commentary on Aristotle's *Physics* Aquinas states that "those things are called causes upon which other things depend for their being (*esse*) or their coming to be

⁸ Contra Kretzmann 1997, 105-8 and Rowe 1975, 37-9, 45-6.

⁹ Against those who hold that Aquinas's claim rests on the rejection of the infinite (eg. Russell 1969, 453; King-Farlow 1975, 353; Hick 1990, 20) and against those who hold that Aquinas's claim relies on maintaining that the entire causal series needs a further cause (e.g. Geach and Anscombe 1961, 112 and Lamont 1995, 269-70).

¹⁰ For Aquinas, it is also often a one-many relation, not a one-one relation (e.g. Thomas Aquinas, *In Librum de Causis Expositio*, prop. 1, n. 34). For discussion of the relevant differences between one-many and one-one causal relations see Kerr 2012, 544-8.

(*fieri*).”¹¹ In the *ST* itself he states that “every effect depends on its cause, insofar as it is its cause.”¹² Perhaps the clearest statement of the connection between ontological dependence and causation comes from Aquinas’s discussion of God’s preservation of creatures in *De Potentia (De Pot.)* where he claims that: “it is necessary that an effect depend on its cause. For this belongs to the notion (*ratio*) of effect and cause.”¹³ Aquinas claims that dependence is part of the very notion (*ratio*) of effect and cause: any effect, insofar as it is an effect, ontologically depends on its cause. Aquinas explicates and defends this claim in stages, starting with formal and material causes and then moving to efficient and final causes so as to apply this claim to all the categories of cause that he recognizes. In each case he argues that the kind of cause in question is ontologically necessary for its effect. Without the material or formal causes that are ontological constituents of composite things, these things would cease to be. Similarly, without its efficient or final causes the effect would either cease to exist or would not have come to be in the first place.¹⁴

Aquinas thus understands the relationship of effect to cause to be a relationship of ontological dependence. Aquinas takes this notion of ontological dependence to be primitive. He explicates the relation of cause and effect in terms of ontological dependence but he does not, in contrast, explicate ontological dependence in terms of

¹¹ Thomas Aquinas, *In octo libros Physicorum Aristotelis expositio*, liber I, lectio 1, n. 5. (*In phys.* I 1.5) Translations throughout are my own, though they reflect my consultation of existing translations. Cf. *In phys.* II 10.240.

¹² *ST* I 104.1. This article also uses the distinction between causes of being and causes of becoming mentioned in his *Physics* commentary.

¹³ *De Pot.* 5.1 *Respondeo*. Cf. Dewan’s discussion of this passage. (Dewan 2006, 67-73)

¹⁴ It is important to note, at this point, a key distinction that Aquinas draws between formal and material causes, on the one hand, and efficient and final causes, on the other. The latter are sometimes only causes of the coming to be of something, but not causes of its being, while material and formal causes are always causes of the thing’s being. For example, the housebuilder is the efficient cause of the coming to be of the house, not of the being of the house. In such cases it is only the becoming of the thing in questions that is ontologically dependent on this cause, not its being.

some further notion.¹⁵ He does make clear some properties he takes it to have, such as being asymmetric, irreflexive, and transitive. He also takes the relationship of dependence that effects have on their causes to be simultaneous. The thing is dependent on its form and matter just as long as it exists: they continually serve as causes.¹⁶ Aquinas seems to think that all cases of ontological dependence involve some kind of causation: he holds, for example, that paradigmatic examples of ontological dependence such as the relationships between accidents and substance and parts and wholes are types of causation.¹⁷ However, Aquinas does not seem to think that the notions of ontological dependence and of cause are strictly the same, insofar as ontological dependence denotes a metaphysical notion while the notion of cause, for Aquinas, involves giving an explanation and is thus epistemological as well as metaphysical.¹⁸

C. The Common Structure of Aquinas's First Three Ways

We have now seen clearly that Aquinas holds that effects ontologically depend on their causes. This is not just part of his general account of causation; it is also central to his proofs of the existence of God. In the *ST*'s discussion of whether the existence of God can be demonstrated, Aquinas uses the ontological dependence of effects on their causes as the basis for his claim that God's existence is demonstrable:

¹⁵ In taking the relation of ontological dependence to be primitive Aquinas's position is similar to the positions taken by a number of contemporary philosophers on ontological dependence such as Jonathan Schaffer, Kit Fine, and Ross Cameron (Schaffer 2009, 364-5; Fine 2001, 1; Cameron 2008, 3).

¹⁶ And similarly with efficient and final causes that are causes of the thing's being (*esse*), and not merely of its becoming (*fieri*).

¹⁷ Aquinas claims that accidents are caused by substances (*In duodecim libros Metaphysicorum Aristotelis expositio*, liber XII, lectio 4, n. 2483 (*In meta.* XII 4.2483)) and he claims that the parts are material causes of the whole, while in some cases the whole is a formal cause of the parts. (*In meta.* V 3.777-9)

¹⁸ Cf. *In phys.* II 5.176. For more discussion of Aquinas on causality see Lawrence Dewan, 'St. Thomas and the Principle of Causality,' in Dewan 2006; Leo Elders, 'Causality,' in Elders 1992, Fabro 1961, and Dodds 2012, chapter 1.

Now from any effect it can be demonstrated that its proper cause exists, as long as its effects are more known to us. For since an effect depends on its cause, if the effect is supposed, the cause must exist by priority [*praeexistere*]. Hence the existence of God, insofar as it is not known to us through itself, is demonstrable through effects that are known to us. (*ST Ia 2.2 corpus*)

Aquinas holds that we can move from effects that are known to us to God, whose existence is not known to us through itself, because these effects ontologically depend on God, their cause. As long as we know that some of the effects caused by God exist we can see that God, their cause, must exist prior to them.¹⁹

We are now ready to turn to the text of Aquinas's proofs and look into why Aquinas holds that the causal series in each of the first three ways cannot go on to infinity. Here are the relevant portions of the first three ways:

1. The first and clearest way is that taken from motion. It is certain, and obvious to the senses, that in this world some things are moved. But everything that is moved is moved by another. If, then, that by which something is moved is itself moved, then it, too, must be moved by another, and that by still another. This, however, does not go on to infinity, because then there would not be any first mover and, in consequence, none of the others would bring about motion, either. For secondary movers bring about motion only because they are being moved by a first mover, just as a stick does not bring about motion except because it is being moved by a hand. Therefore, one must come to some first mover that is not being moved by anything. And this is what everyone understands to be God.

¹⁹ Where, again, this priority is ontological, not temporal.

2. The second way is from the notion of an efficient cause: We find that among sensible things there is an ordering of efficient causes, and yet we do not find—nor is it possible to find—anything that is an efficient cause of its own self. For if something were an efficient cause of itself, then it would be prior to itself—which is impossible. But it is impossible to go on to infinity among efficient causes. For in every case of ordered efficient causes, the first is a cause of the intermediate and the intermediate is a cause of the last—whether the intermediate causes are many or only one. When, however, a cause is removed, its effect is removed. Therefore, if there were no first among the efficient causes, then neither would there be a last or an intermediate. But if the efficient causes went on to infinity, there would not be a first efficient cause, and so there would not be a last effect nor any intermediate efficient causes—which is obviously false. Therefore, one must posit some first efficient cause—which everyone calls God.
3. The third way is taken from the possible and the necessary.....there must be something necessary among things. Now every necessary being either has a cause of its necessity from outside itself or it does not. But it is impossible to go on to infinity among necessary beings that have a cause of their necessity, in the same way as it is impossible [to go on to infinity] among efficient causes, as was proved. Therefore, one must posit something that is necessary through itself, which does not have a cause of its necessity from outside itself, but is instead a cause of necessity for the other [necessary] things. But this everyone calls God. (*ST Ia 2.3 corpus*)

In each of these first three ways for proving the existence of God, the final major premise from which the existence of God is concluded (“there is a first unmoved mover,” “there is a first uncaused efficient cause,” and “there is a first being necessary through itself”) is reached by seeing that the series considered in the argument cannot proceed *in infinitum*.²⁰ This is seen in each case by a reduction to the absurd: if there is no first mover or first efficient cause or first necessary being, there will be, respectively, no subsequent movers or efficient causes or necessary beings; but we see that there is a mover, an order of efficient causes, and a necessary being. Therefore, there must be a first in each case.

As their common structure suggests, the nature of the *reductio* argument is the same in each of the three ways. The sequences of moved movers, efficiently-caused efficient causes, and necessary beings having their necessity from something else all have the same formal features. Each series is infinite, asymmetric, irreflexive, and wholly derivative: they are all cases of essentially ordered causal series. To begin with, each of the series is infinite in the same way since each is considered as proceeding from a last member to earlier members in a process ascending *in infinitum*.²¹ Each series is also irreflexive. In the first two ways, we have a series of moved movers and efficiently-caused efficient causes, respectively. Central to the first way is Aquinas’s claim that

²⁰ST Ia 2.3. I.e. one cannot proceed into an infinity of moved movers, efficiently caused efficient causes, or necessary beings having their necessity from another without ever coming to a first or limit. I will only address the soundness of the premises and validity of the arguments which lead to a mover, order of efficient causes, and a necessary being insofar as this is required for my argument. My principal goal is to see how, given the claims that Aquinas has made, one must come to a first cause in each of these ways.

²¹Ibid. The first way starts with something moved and then argues to a mover of this moved thing. If this mover is moved, it will be the last member of the series of moved movers, since what it moves is not itself a mover. (or at least is not being considered as such) It is then the last moved mover and the series will ascend through prior moved movers *in infinitum*. Similarly, in the order of efficient causes the efficient cause whose effect is not also a cause would be the last member of the series of efficiently caused efficient causes since all the prior efficient causes cause an effect which is also an efficient cause. Again, in the third way the last necessary being would be one which does not give its necessity to another, unlike all the prior members. In all three cases one ascends *in infinitum* from the last members of these series.

whatever is moved is moved by something else. Similarly, one of the central claims of the second way is that nothing can be an efficient cause of itself. These are strong and contentious metaphysical claims and I am not going to discuss them further here, since my aim is simply to consider whether, given the rest of his premises, Aquinas is justified in holding that infinite causal regression is impossible.²² In the third way, where we are considering the possibility of an infinite sequence of necessary beings having their necessity from another, it is true by definition that such beings cannot be the cause of their own necessity.

Aquinas takes these series to be not just transitive, but wholly derivative. In each of the series, every member of the series is a member only because of the previous members. Each mover is a mover only because it is being moved by all the previous movers, each efficient cause efficiently causes only by being efficiently caused by all the previous efficient causes, and each necessary being imparts necessity only insofar as it receives its necessity from all the previous necessary beings. Essentially ordered series do not consist of a succession of isolated dependence relations (as accidentally ordered series do), but of one continuous dependence relation. Gaven Kerr presents a helpful way of formalizing this difference: accidentally ordered series can be represented as a series of one-one dependence relations where each member depends directly only on the previous member: $(v \rightarrow w) \rightarrow (w \rightarrow x) \rightarrow (x \rightarrow y)$. In essentially ordered series, by contrast, the later members depend directly on (and derive their membership from) all the earlier members: $(v \rightarrow (w \rightarrow (x \rightarrow y)))$.²³

²² For further discussion of these two claims and the first two ways in general, see Wippl 2000, 444-62.

²³ See Kerr 2012, 543-8 for further discussion of the difference between these two kinds of dependence relations. My interpretation of Thomas Aquinas fits well with Kerr's general characterization

Given this wholly derivative character, essentially ordered series must be asymmetric. If a series circled back on itself so that Δ , a derivative member, was a member because of Φ which, in turn, was a member because of Δ , then Δ , which by definition is a member only derivatively, would end up being the source of its own membership. As Aquinas points out, however, this would be equivalent to saying that the teacher is teaching in precisely the same respect that the teacher is being taught.²⁴ (*SCG*, I.13.19) This illustrates, once again, the importance of Aquinas's earlier premises. If Aquinas is correct in claiming that things cannot, strictly speaking, move themselves or act as their own efficient causes, then there is no possibility of circularity.²⁵

of essentially ordered series. One difference in our presentation is that Kerr defines an infinite series as a series that is lacking an origin or first, non-derivative member, (Kerr 2012, 550) and thus maintains that such series are impossible, whereas I am characterizing an infinite series simply as a series that has an infinite number of members and thus maintain in section E that Aquinas can allow for an essentially ordered series with infinitely many members as long as there is a first, non-derivative member of such a series.

²⁴ It is important to note that in an essentially ordered series each intermediate member depends on the preceding ones in precisely those respects that make it a member (e.g. the stick depends on the hand for making it capable of moving the stone, and thus for being a moved mover, while the hand depends on the man for making it capable of moving the stone, and thus for being a moved mover etc.). Since the chain is one that always concerns the same ontologically dependent aspect, if the chain were to circle back on itself, the member would be depending on itself with respect to the very same aspect for which it needs some further source. When we are discussing different kinds of causation or different aspects of a caused thing Aquinas can allow for circularity. Walking, for instance, can be an efficient cause of health and health a final cause of walking. Similarly, if my son's ability to construct a toy castle depends on my ability to give him directions and my ability to give him directions depends on him letting me see the instructions, then, even if, in some sense, my son's dependent ability to build depends on himself there is no worry about circularity because the aspect in which he depends on me is different from the aspect in which I depend on him.

²⁵ There is a complication in the case of Aquinas's first way, since Aquinas thinks there are multiple fundamentally distinct species of motion. Could the unmoved mover be unmoved with respect to place but moved with respect to alteration or some other species of motion? This objection can be resolved by noting that for Aquinas there are a finite number of species of motion. If the initial unmoved mover is moved with respect to some other kind of motion, there will have to be an unmoved mover with respect to this other kind of motion. Eventually one must come to something unmoved with respect to any motion. This leads into a new version of the circularity objection: what if that which is unmoved with respect to place is moved with respect to alteration and that which is unmoved with respect to alteration is moved with respect to increase and that which is unmoved with respect to increase is moved with respect to place? This objection leads to the same problem as the initial objection from circularity, since the same thing will be moved and not moved in the same respect, albeit through the mediation of the other species of motion. This objection is simply a more complex version of the circular series objection and has the same resolution, as Aquinas notes. (*SCG*, I.13.19)

The claim that every intermediate member of the series depends on all the previous ones is perhaps less evident in the case of the sequence of movers that forms the basis of the first way. Many commentators, especially those who are not specialists in medieval philosophy, are tempted to read the first way as talking about a temporal succession of movers where each mover has been moved by some earlier mover at some point in time but whose current ability to act as a mover does not now depend on being moved by the earlier mover. When understood this way, Aquinas's denial of the possibility of an infinite series seems, as Russell and Hick suggest, to involve a cognitive failure to grasp that an infinite series is, in fact, a possibility.²⁶ At best, Aquinas has some background argument against the infinite which he is assuming in his proof.

In fact, as we have seen, Aquinas is committed to the simultaneity of causation, so the series which are under discussion, even in the first way, are ordered in terms of ontological dependence, not temporal succession. Aquinas's example of the stick moving the stone insofar as it is being moved by the hand is meant to serve as a paradigmatic instance of a sequence of simultaneous moved movers, a purpose for which Aquinas regularly cites it.²⁷ Aquinas is considering an essential order of movers, not some accidental combination of various motions and movers that are not essentially related.²⁸ If the hand were to cease moving the stick, the stick would cease to act as a mover pushing the stone. The moving activity that the stick performs is dependent on its being moved, on receiving from the hand the power to be a mover. Although Aquinas does think that these motions are simultaneous, the key issue here is ontological dependence, in this case

²⁶ Cf. Russell 1969, 453; Hick 1990, 20.

²⁷ *In phys.* VII 2.892; *SCG* II 38.13.

²⁸ *Ibid.* To take an example, a fire which is causing heating while being unmoved with respect to heat would not become a moved mover if it (along with the combustible) moved according to place, except insofar as the movement according to place would impede or enhance the fire's ability to cause heat.

the dependence of the activity of one thing on the activity of others. Even if there is some gap between the hand's moving activity and that of the stick, as long as the continuing action of the stick depends on the continuing action of the hand, and the continuing action of the hand depends on continuing action of the man and so on *in infinitum*, each mover will be a mover only insofar as it is being moved by all the previous movers.

D. Why Essentially Ordered Causal Series Need a First Cause

Aquinas holds that the series at issue in the first three ways all have an ordering of ontological dependence or causality between every member such that each member is dependent on all the prior members for being the sort of cause that it is. A member of one of these series cannot act as a mover, serve as an efficient cause, or impart necessity apart from the antecedent members that cause them to be the sort of causes that they are.²⁹ In each of these series every intermediate cause is the cause of the posterior cause precisely insofar as it is caused by the prior cause. To give an illustration of the sort of dependence on prior members which Aquinas has in mind, consider a flower pot suspended by a chain of rings. The bottom ring holds up the flower pot, but it holds up the flower pot only in virtue of being held up by the ring above it which, in turn, holds up the ring and the flower pot only because it is held up by the ring above it. Each ring is a held-up holder up, if you will. In such a series, each ring is simultaneously active in holding up the posterior rings and passive in being held up by the prior rings and whatever holds them up. Aquinas' argument is meant to rule out the possibility of this series of rings continuing on *in infinitum* without coming to something that is independently stable.

²⁹The priority of the earlier members is, consequently, a priority with respect to ontological dependence and may not (and, in some cases, like the necessary beings of the third way, cannot) involve temporal priority.

Since the flowerpot is, in fact, held up, it must ultimately be held up by something that holds itself up and is not a held-up holder up.³⁰

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. Each of the intermediate members of the series exercises a causal power that it possesses derivatively. Since the series are wholly derivative, each member in the series only has what it has via its dependence on all the previous members. It has to be receiving in order to give and there must be a source that accounts for what it receives. If there is no first non-derivative member of the series, then there is no such source. 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. The ring does not independently have the power to hold up the flower pot and it would not derivatively have this power if all the rings were not held up by something which is independently and non-derivatively stable. If there is no first cause, the intermediate causes will not be causes since they depend on the first for their causal powers. There would then be no cause to account for the effect that is observed. Thus if there is no first cause, there will

³⁰ Cf. the chain illustration of Wollaston cited in Samuel Clarke's version of the cosmological argument (W. Wollaston, *The Religion of Nature Delineated*, 67). Phillips gives another illustration along the same lines: imagine a series of train cars where each one pulls the succeeding one insofar as it is pulled by the preceding one. Since each train car only has the power to pull other cars derivatively, they won't actually be able to pull each other, no matter how many of them there are, unless there is an engine, a first puller. (Phillips 1935, 278; Edwards 2000, 205-7 and Mackie 2000, 220-1 both discuss this illustration)

be something that is an effect but that lacks a cause capable of producing this effect, and this is impossible.

John Haldane gives an example that vividly illustrates the problems of essentially ordered causal series lacking a first cause. 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 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.”³¹ In this set-up, the causal power of being a reviewer is derivative, as no person can be a reviewer unless she’s been reviewed. It is also wholly derivative as each person’s status as a reviewer depends not only on being reviewed by someone but also on that person being a reviewed reviewer who has been reviewed by a reviewed reviewer and so on *in infinitum*. If, however, there is no first un-reviewed reviewer then there is no one with the right causal power to get the series started. The problem remains even if the reviewing process had been in place since the university’s founding and even if the university had always existed. You can’t give what you don’t have. If no one is a reviewer in her own right, then no one could become a reviewed reviewer, since there wouldn’t be anyone with the requisite status to review so as to make a reviewed reviewer. No one could rightly claim to be a reviewed reviewer unless there is a first non-derivative reviewing cause. In the end, the University of St. Andrews realized the impossibility of their set-up and designated one of the senior administrators as an un-reviewed reviewer.³²

The conviction that these series are wholly derivative underlies Aquinas’s claim that the secondary or intermediate members of the chains of causal and ontological

³¹ Smart and Haldane, 129-31.

³² Ibid.

dependence in question depend on a first member. When the wholly derivative nature of the series in question is overlooked, Aquinas seems to be assuming what he is trying to prove. This shows up clearly in Kenny's discussion of the five ways. Kenny alleges that in the first way Aquinas illicitly shifts his usage of *primum*, moving from using it to mean earlier to using it to mean first and independent.³³ On my reading, in contrast, Aquinas consistently uses first, *primum*, to mean independent and uncaused. The principle he cites, "secondary movers bring about motion only because they are being moved by a first mover," does not follow simply from the definition of secondary but instead comes from the wholly derivative nature of the series in question. The example of the hand is not used as an instance of depending on a first mover, but rather as a basic illustration of the way in which secondary movers continue to depend on earlier movers and, hence, in wholly derivative series, on the first mover.

The first way on its own does not allow us to decide between these readings. However, Aquinas's use of this principle becomes clear in the second way. Here he claims that "in every case of ordered efficient causes, the first is a cause of the intermediate and the intermediate is a cause of the last—whether the intermediate causes are many or only one."³⁴ Here it is clear that Aquinas is speaking about a first cause, not an earlier cause, and that his claims are restricted to essentially ordered series of causes. Aquinas notes that it does not matter whether there are many intermediate causes or only one. Whatever the case may be, each intermediate cause depends on the first cause because the causal series in question is essentially ordered and, in consequence, wholly derivative.

³³ Kenny 26-7.

³⁴ *ST I 2.2* corpus.

E. Aquinas and the Infinite

The qualified nature of this principle makes it clear that Aquinas' objection comes from the wholly derivative nature of essentially ordered series, not from a general antipathy to infinite series. Indeed, in his commentary on Aristotle's *Metaphysics* Aquinas, following Aristotle, explicitly states that whether the intermediate causes are finite or infinite in number makes no difference to whether there must be a first cause: "Nor again does it make any difference whether there are a finite or infinite number of intermediates, because so long as they have the nature of an intermediate they cannot be the first cause of motion."³⁵ Aquinas does not reject infinite essentially ordered causal series because he rejects series that go on to infinity.³⁶ Indeed, Aquinas allows for several types of infinite series, including certain sorts of infinite causal series.

Similarly, Aquinas does not reject these series because they would lack a temporal beginning, as is clear from his position that reason cannot demonstrate that the world has a temporal beginning.³⁷ Now these infinite series would all be actually infinite, since all their members would exist at once, and Aquinas does give a general argument against the possibility of any simultaneously actual infinite multitude later in the *ST*.³⁸ However, even if Aquinas would deny that there can be a simultaneously actual infinite multitude, that denial is not the grounds for his rejection of infinite essentially ordered causal series. As I just noted, he is happy to wave his objection to the actual infinite in order to make clear the fundamental reason for rejecting infinite essentially ordered

³⁵ *SLM*, II 3, 303.

³⁶ Contrary to some, such as John King-Farlow who claims that "the core of the First Way is highly controversial about infinity" and that Aquinas's "primary reason" for rejecting an infinite causal series of movers is Aquinas's objection to an actual infinite. (King-Farlow 1975, 353 cf. Russell 1969, 453; Hick 1990, 20)

³⁷ *ST* Ia.46.2.

³⁸ *ST* Ia.7.2-4.

causal series. Moreover, in later texts Aquinas seems to allow for the possibility of an actually infinite multitude of spiritual entities.³⁹ This suggests that Aquinas would concede that an actually infinite multitude of necessary beings having their necessity from another, such as angels, is possible. Indeed, later in the *Summa* Aquinas also allows that certain causal series that are not wholly derivative can be infinite while in the *Quaestiones de quolibet* he suggests that the existence of an actual infinite would not be contrary to God's power.⁴⁰

F. Response to Objections and Further Implications

I have argued that the wholly derivative nature of infinite essentially ordered causal series means that the intermediate causes in such a series depend on the first member for their causal powers. I will now explain how my interpretation of the argument avoids two common objections to regress arguments. First of all, Edwards objects that inferring there must be a first, non-derivative member is not warranted in the case of an infinite series. He concedes that any *finite* chain of dependency must terminate in a first, but he maintains that an *infinite* dependent series has no need of a first, non-derivative member, since each member has another previous member to depend on.⁴¹ Each ring in the infinite chain, for example, is held up by the one above. Kerr's formulation of the difference between accidentally and essentially ordered series helpfully illustrates why Edwards' claim applies only to accidentally ordered series. In an accidentally ordered series such as $(v \rightarrow w) \rightarrow (w \rightarrow x) \rightarrow (x \rightarrow y)$, I need only know that x

³⁹ *De Aeternitate Mundi*, Leonine 433.89:306-8. Cf. *SCG* II 81, 9. For discussion, see Wippel 2000, 409, fn. 26. and Dewan 2001, 125.

⁴⁰ *ST* Ia.46. 2; *Quaestiones de quolibet* 12.2.2 [3], 400, 12-3. Aquinas does, nevertheless, maintain that the formlessness of an actual infinite precludes God from actually creating it. R.-A. Gauthier dates this work to 1272, implying that it would be the final time Aquinas addresses this question. (Dewan 2001, 130)

⁴¹ Edwards 2000, 206.

is the cause of y in order to account for y as an effect. While x may itself be dependent on some prior cause, this does not matter for its causation of y . In essentially ordered series, by contrast, the later members depend directly on (and derive their membership from) all the earlier members: $(v \rightarrow (w \rightarrow (x \rightarrow y)))$. The dependency does not terminate at the previous member but continues until we come to a first, independent member. 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.

Mackie raises a second prominent objection to regress arguments: why should the first cause be “the one exception to the supposed need for something else to depend on?”⁴² If the regress rests on the claim that everything must depend on something beyond itself, then postulating a first cause will not help, since the first cause will itself be in need of something on which to depend. On my interpretation, Aquinas clearly avoids this problem as he has principled reasons for holding that intermediate, derivative causes need a source of their causation in a way that a first, non-derivative cause does not. Aquinas’s regress argument requires only the claim that every dependent thing needs something on which to depend. Independent things have no such need. Stopping at entities that have the

⁴² Mackie 2000, 221. Mackie is not directly evaluating Aquinas’s argument but the objection he raises is a common rejoinder to regress arguments and thus worth considering. Mackie does evaluate one interpretation of Aquinas’s argument and rejects it (220-1) but his basis for doing so is not entirely clear: either he concedes that Aquinas’s regress argument would show there must be a first cause but denies that this first cause would need to be God or he denies that Aquinas’s regress argument does require us to posit a first cause.

relevant causal powers non-derivatively, such as a solidly secured pole or a train engine, makes sense in a way that stopping at rings or train cars does not.

Finally, I want to note that on my interpretation Aquinas's argument is significantly different from many modern versions of the cosmological argument, insofar as it does not rely on a version of the PSR or on taking the whole universe to be a single object. As I noted earlier, Kretzmann maintains that Aquinas's claim rests on a version of the PSR: "every existing thing has a reason for its existence either in the necessity of its own nature or in the causal efficacy of some other beings."⁴³ In fact, Aquinas does not rely on the PSR but on several weaker claims. Indeed, Aquinas would qualify even Kretzmann's version of the PSR as he holds that some things, namely those that happen by luck or chance, have no *per se* cause.⁴⁴ The central claim that Aquinas employs in rejecting infinite causal series is simply that an effect, insofar as it is an effect, must have a cause capable of producing it. This claim is much weaker than any version of the PSR and it is hard to see what reasons one might have for denying it. Even David Hume's claim that an effect can be disassociated from its cause seems really to be a claim that those things which are commonly taken to be effects may not in fact be effects (in any strong sense).⁴⁵ If something is an effect, i.e. ontologically dependent, it must have a cause, i.e. something on which it ontologically depends, whether or not there are some

⁴³ Kretzmann, 107-9. He takes this weaker formulation from Rowe 1975, 261.

⁴⁴ In *ST* Ia 115.6 Aquinas argues that things that happen accidentally, e.g. by luck or chance, do not have some pre-existing natural cause. Aquinas does hold that such things are included in the order of divine providence, (Ia 116.1) but given his views on the freedom of the divine will to create or not create and to create a variety of universes (*ST* Ia 19.2-3; 25.5) there will not be a sufficient reason in Leibniz's sense for such occurrences. Cf. *In. Phys.* II 7-10.

⁴⁵ David Hume, *An Enquiry Concerning Human Understanding* IV.I (para. 25, p. 29) and *A Treatise of Human Nature* I.III.III 79-80. Hume's claim does, of course, conflict with Aquinas's account of causation and thus with some of the earlier premises of the first three ways. My point is simply that, properly understood, it challenges Aquinas's argument at these earlier stages, not at the stage where Aquinas rejects infinite essentially ordered causal series.

contingent things that lack causes. This, of course, puts more weight on Aquinas's initial claims about the existence of certain effects and series of causes and effects, claims that a Humean skeptic would certainly call into question. Nonetheless, it is an important philosophical achievement to show, as I have attempted to do, that if Aquinas's earlier premises are correct, then there cannot be a series of causes proceeding *in infinitum* but there must, instead, be a first cause.

On my reading, the starting points of the first three ways are supposed to be basic and manifest truths about the things around us: some things are in motion, there is an order of efficient causes, some things come to be and pass away. In these three ways Aquinas does not rely on the idea that the world as a whole must have a cause or that the universe must have a beginning, in contrast to many other versions of the cosmological argument.⁴⁶ Instead, Aquinas is claiming that from the things we see around us right now we can trace a chain of ontological dependence back to God. I thus think we should reject Geach's interpretation of Aquinas's proofs which takes Aquinas's procedure to involve "lumping things together" into a "world" and treating the world "as a great big object," and thus assimilates Aquinas's cosmological argument to more modern versions.⁴⁷ Although Aquinas does think that there is a chain of dependency between the things in our world, it is a chain between multiple distinct objects and there is no indication that Aquinas takes the chain to result in one, big, super-object.⁴⁸ Aquinas's premises do rely

⁴⁶ See the survey of approaches to the cosmological argument offered in Reichenbach 2010.

⁴⁷ Geach and Anscombe 1961, 112-4; Cf. Lamont 1995, 269-70.

⁴⁸ It is important to note here that, contrary to Craig's assertion that "the only cause that is really moving anything is the first cause," (Craig 1980, 174) Aquinas really does believe (and has reason to believe) that intermediate causes are *causes* and do possess the relevant causal features, albeit derivatively. It's true to say that the stick moves the stone or that the hand moves the stone, even though their moving powers are derivative, just as it is true to say that many of the properties of water depend on its composition out of hydrogen and oxygen, even if the properties of hydrogen and oxygen in turn depend on their atomic (and sub-atomic) structures.

on his controversial view of causation, according to which there are strong relations of ontological dependency between the things we see around us. Given, however, that a number of contemporary metaphysicians have views of ontological dependence that result in similarly strong connections between dependent entities and the things on which they depend, I think Aquinas's view of ontological dependence cannot be ruled out as hopelessly archaic or obviously mistaken and thus the proof as a whole is worth considering.⁴⁹

These considerations point out the importance of the preceding premises to Aquinas's argument, but they continue to affirm the soundness of his rejection of infinite essentially ordered causal series, given his premises and his view of causation. Thomas Aquinas presents a commensurately universal objection against an infinite causal series based on the essential absurdity peculiar to such series: producing uncaused effects. This absurdity arises because the succession of movers, efficient causes, and necessary beings is an essentially ordered series of intermediate causes and all such series are dependent on having a first member which is a member through itself. This can be seen through a *reductio*: if there is no first member, none of the other members will be members, since they are only intermediate members dependent on receiving membership from the first. There are, however, intermediate members; therefore, there must be a first. To claim there is no first uncaused member is to deny the cause, the ontologically independent entity, which is necessary for all the ontologically dependent members. If Aquinas'

⁴⁹ E.g. Fine 2001, Cameron 2008, Schaffer 2009. Although contemporary metaphysicians usually see ontological dependence as proceeding downwards towards fundamental physics, Schaffer has argued that ontological dependence runs upwards to the world as a whole (though he rejects the idea that it proceeds to an independent source beyond the world).

earlier premises are sound, then there must be a first unmoved mover, a first efficient cause, and a first necessary being.⁵⁰⁵¹

⁵⁰ This suggests a further line of questioning that should be mentioned briefly. If there is a first mover, first efficient cause, and first necessary being will these all be the same divine being? For instance, what if the first mover turns out to be my soul, not God? Addressing this query lies beyond the scope of this paper, but it is worth indicating Aquinas's key moves. Central to the next question, *ST Ia 3*, on divine simplicity, are Aquinas's arguments that the first cause in each of the five ways must be pure actuality without any potentiality. If successful, these arguments, together with an argument that there cannot be many beings that are pure actuality, would be sufficient for showing that all the five ways converge on one and the same divine being.

⁵¹ Earlier versions of this article were presented at the 2011 Society of Christian Philosophers Mountain Pacific Regional Conference, the 2010 joint meeting of the Society for Ancient Greek Philosophy (SAGP) with the Society for the Study of Islamic Philosophy (SSIPS), and a 2010 meeting of the Princeton Philosophical Society. I would like to thank the audiences on these occasions for their helpful questions and comments. I would also like to thank Kevin Kolbeck, in whose class I first examined Aquinas's proofs, for the introduction he gave me to interpreting the Five Ways.

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