


Hierarchical Causes in the Cosmological Argument

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I

Aquinas' "Second Way" of arguing for the existence of God runs as follows:

In the world of sensible things we find there is an order of efficient causes. There is no case known (neither is it, indeed possible) in which a thing is found to be the efficient cause of itself; for so it would be prior to itself, which is impossible. Now in efficient causes it is not possible to go on to infinity, because in all efficient causes following in order, the first is the cause of the intermediate cause, and the intermediate cause is the cause of the ultimate cause, whether the intermediate cause be several, or only one. Now to take away the cause is to take away the effect. Therefore, if there be no first cause among efficient causes, there will be no ultimate, nor any intermediate cause. But if in efficient causes it is possible to go on to infinity, there will be no first efficient cause, neither will there be an ultimate effect, nor any intermediate efficient causes; all of which is plainly false. Therefore, it is necessary to admit a first efficient cause, to which everyone gives the name of God. 1

One natural way of reading this argument is to take it as an attempt to rule out the possibility of an infinitely long series of efficient causes and their effects stretching back into the past, with each efficient cause existing prior to its effect (in a temporal sense of "prior to"). However, this is clearly not what Aquinas intended; he suggested in another place (ST 1, 46, 2) that an infinitely long temporal regress of efficient causes and their effects is quite possible. Authoritative interpreters of Aquinas stress that what he had in mind was an infinitely long causal series in which efficient causes and their effects exist simultaneously - this is what his argument was meant to rule out. Every causal series in which efficient causes and their effects exist simultaneously (and in which the term "prior to" is understood in a logical rather than temporal sense) must be of only finite length and must culminate in a first efficient cause. Thus Frederick Copleston says:

When Aquinas talks about an "order" of efficient causes he is not talking of a series stretching back into the past, but of a hierarchy of causes, in which a subordinate member is here and now dependent on the causal activity of a higher member ... We have to imagine, not a lineal or horizontal series, so to speak, but a vertical hierarchy, in which a lower member depends here and now on the present causal activity of the member above it. It is the latter type of series, if prolonged to infinity, which Aquinas rejects. And he rejects it on the ground that unless there is a "first" member, ... a cause which does not depend on the causal activity of a higher cause, it is not possible to explain the ... causal activity of the lowest member. His point of view is this ... Suppress the first efficient cause and there is no causal activity here and now. If therefore we find that ... there are efficient causes in the world there must be a first efficient, and completely non-

dependent cause. The word "first" does not mean first in the temporal order but supreme or first in the ontological order.²

Let us then stipulate that "x is the linear cause of y" means that x causes y to exist in such a way that y can continue to exist even if x ceases to exist or ceases its causal activity. Clearly there are causal relationships like this, e.g., "The carpenter makes (i.e., causes to exist) the chair." Here the causal relationship between the carpenter and the chair is such that the chair can perfectly well go on existing even if the carpenter ceases all chair-making activity or even dies. Let us stipulate that "x is the hierarchical cause of y" means that x causes y to exist in such a way that y cannot continue to exist unless x continues x's causal activity; as Copleston says, y "here and now" depends for its existence on x. Clearly there are causal relationships like this too, e.g., "The minstrel makes the music" (an example used by P. T. Geach).³ Here the causal relationship between the minstrel and the music is such that if the minstrel dies or even stops playing, the music ceases; the existence of the music depends "here and now" on the musical activity of the minstrel.

Now it is not at all difficult to imagine why Aquinas thought that God's causal relationship to the world was hierarchical rather than linear. Like virtually all Christian theologians, he held to the doctrine that the world depends for its existence not just on God's initial act of creation long ago but on God's continual sustaining activity. If God were to cease sustaining the world in existence, the world would no longer exist. This much, I think, is reasonably clear.

But what is puzzling is the purely logical claim of Aquinas and Copleston that infinite regress is possible in a linear causal series but not in a hierarchical causal series. Precisely why is it, we might ask, that the Second Way is supposed to be successful in ruling out an infinitely long hierarchical causal series but not in ruling out an infinitely long linear causal series? The question does not seem to be answered in Aquinas' statement of the Second Way (cited earlier). Surely (so we are tempted to say) if the argument succeeds in ruling out the possibility of one sort of infinitely long causal series, it succeeds in ruling out the other too; surely if it fails to rule out the possibility of one sort of infinitely long causal series, it fails to rule out the other too.

This, then, is the question I want to address in the present paper: is it true that infinite regress is possible in a linear causal series but not in a hierarchical causal series? And if so, why? Let me provide a brief guide as to how my argument will proceed. Having now established the problem that I hope to solve, I next plan to discuss some possible solutions to it. In Section 2 I will consider material in the writings of Aquinas himself that might be taken to solve the problem. In Section 3 I will consider what I will call the "standard answer" to the problem (an answer that revolves around the notion of explanation). It can be found, among many other places, in the writing of Patterson Brown and William Rowe. I will find both Thomas' own arguments and the "standard answer" inadequate to solve the problem. In Section 4 I will develop a version of my own of the cosmological argument, one which I believe shows that Copleston was correct in interpreting Aquinas as he did, i.e., one that solves the problem I am attacking in this paper. Finally, in Section 5, I will assess what the overall argument of the present paper has shown and not shown. Although my paper constitutes a vindication of one of Aquinas' critical claims (viz., that infinite regress is possible in a linear causal series but not in a hierarchical causal series), I doubt that Aquinas would approve of my argument (for reasons that I will point out).

II

Aquinas discussed the concept of infinity in several places,⁴ but I do not believe we find in his works a solution to the problem we are considering. For one thing, his arguments were frequently directed not so much toward the possibility of an infinite regress of causes as toward the possibility of actual infinities of any kind (as he put it, whether an "infinite multitude" is possible). For another, some of Aquinas' arguments are as puzzling as they are illuminating, in part because they do not seem consistent with each other. In places, for example, he argued (against Avicenna and Algazel) that no actual infinite can exist - infinities can only exist potentially (ST 1, 7, 4); while in other places he allowed for certain sorts of actual infinities (ST 1, 46, 2ad 7).⁵ Finally, some of Aquinas' arguments designed to rule out infinite regress apparently have nothing to do with the distinction between linear and hierarchical causation.

However, let me mention one argument that we find in both Summas and that is relevant to the point with which we are concerned. In SCG II, 38, where Aquinas was discussing the question whether the world is eternal, he argued that it is not possible to proceed to infinity in an order of efficient causes acting simultaneously. He said:

For, according to the philosophers, it is impossible to proceed to infinity in the order of efficient causes which act together at the same time, because in that case the effect would have to depend on an infinite number of actions simultaneously existing. And such cases are essentially infinite, because their infinity is required for the effect caused by them. On the other hand, in the sphere of nonsimultaneously acting causes, it is not, according to the partisans of the perpetual generation theory, impossible to proceed to infinity. And the infinity here is accidental to the causes; thus, it is accidental to Socrates' father that he is another man's son or not. But it is not accidental to the stick, in moving the stone, that it be moved by the hand; for the stick moves just so far as it is moved.

Similarly, in ST 1, 46, 2ad 7, Aquinas said:

In efficient causes it is impossible to proceed to infinity per se - thus, there cannot be an infinite number of causes that are per se required for a certain effect; for instance, that a stone be moved by a stick, the stick by the hand, and so on to infinity. But it is not impossible to proceed to infinity accidentally as regards efficient causes; for instance, if all the causes thus infinitely multiplied should have the order of only one cause, their multiplication being accidental, as an artificer acts by means of many hammers accidentally, because one after the other may be broken. It is accidental, therefore, that one particular hammer acts after the action of another; and likewise it is accidental to this particular man as generator to be generated by another man; for he generates as a man, and not as the son of another man.

Aquinas suggested here a distinction between (1) causes that are infinite essentially or per se and (2) causes that are infinite accidentally. (This is much like Copleston's distinction between hierarchical and linear causes, and I will assume that it amounts to the same distinction, which is surely what Copleston intended.) There cannot be an infinite regress consisting of causes of the first sort because a given being exists only so long as all of its hierarchical causes exist too; as Aquinas said, in causing x to exist they must "act simultaneously." The movement of the stone depends hierarchically (essentially, per se, "here and now") on the movement of the stick, which depends hierarchically (essentially, per se, "here and now") on the movement of the hand. Thus the stone can move only so long as the stick and the hand are moving too. There can be no infinite regress here because if there were, we would have an infinite number of simultaneously acting causes, which, Aquinas said, is impossible. But so far as linear or accidental causes are concerned, infinite regress is possible; an artificer could use an infinite number of hammers to produce (say) a statue because there is no particular causal order in the use of the various hammers; more importantly, the hammers are efficient causes of the statue only linearly or accidentally; the statue can continue to exist even if they no longer exist.

Aquinas' many arguments about infinity in general and infinite regress in particular are not easy to pull together into a coherent position. Let me propose the following interpretation. His core insight (especially in the two Summas) was that infinities can exist only potentially, never actually: "It is impossible for there to be an actually infinite multitude, either absolute or accidental" (ST 1, 7, 4; cf. SCG I, 69 [4]; II, 81 [4]). He allowed that an infinite number of things could exist at different times; an infinite number of hammers could be used to produce a given work "if the work is carried on for an infinite time" (ST 1, 7, 4).⁶ It is in this sense that Aquinas allowed for the possibility of an infinite regress of linear or accidental causes of x; for such causes need not exist and act simultaneously in producing x. But there can be no infinite regress of hierarchical or per se causes of x, because x exists only so long as all of x's hierarchical causes exist; since there can be no actual "infinite multitude" existing at the same time, x must have only a finite number of hierarchical causes. No infinite number of things can exist and act at the same time or even in some finite period of time (SCG I, 13 [12]; II, 38 [13]). This is because "it is impossible to pass through an infinite medium" (ST 1, 7, 4).⁷

Is this a good argument? 8 2 There appear to be two critical questions that we must ask: (1) Was Aquinas correct in his claim that no infinite number of things can simultaneously exist?,⁹ and (2) Was Aquinas correct in his claim that no infinite number of things can act in a finite time? So far as the first is concerned, it is difficult to accept Aquinas' argument. If physical objects are infinitely divisible, and if each division of a given physical object (say a chair) results in something that could legitimately be called a "thing," then it seems to follow that there are in fact an infinite number of things existing simultaneously. Now perhaps, in fact, it is not true that things are infinitely divisible. Perhaps future science will discover that certain elementary particles (quarks, let's say) are indivisible or metaphysically simple or not composed of parts. Maybe then the total number of quarks and other things that will ever exist in the history of the universe is (very large but) finite. Still, the question remains: Is there any logical incoherence in the idea that every physical object or quantity is divisible and that accordingly there are an infinite number of things? If not, then it seems that given Thomistic notions of divine omnipotence (ST 1, 25, 3), it would be well within God's power to divide items that do not in fact consist of parts, and thus create an infinite multitude.

Now Aquinas did admit that an infinite number of linear causes of x can exist (at different times). But it should be noticed that there is nothing about the notion of linear causes of x that requires them to cease existing during the lifespans of their effects. Suppose, then, that a given statue was in part caused to exist by an infinite number of hammers (as long as the hammers exist at different times, Aquinas was prepared to admit that this is possible). But now why couldn't all of the broken-but-still-existing hammers be saved? They exercised their causal power over the statue at different times, to be sure, and perhaps it has taken an infinite number of years to produce it (in its present state of completion); but why can't all the hammers exist at once and thus constitute an "infinite multitude"? Is it because the universe, being finite in size, isn't nearly large enough to contain an infinite number of physical objects? But then why couldn't God one fine day decide to expand in finitely the size of the universe? Is there then any reason to think that things like infinite multitudes or infinitely large physical objects are logically impossible?

And if the answer to Aquinas' first question is yes, the second must be answered in the same way. Why deny that an infinite number of hierarchical causes can act simultaneously or in some finite time to cause a given x? Aquinas did say in ST 1, 7, 4 that nothing can depend for its existence on an infinite multitude because "its generation could never come to be, because it is impossible to pass through an infinite multitude." (Here he was citing the position of Avicenna and Algazel with - at this point in the argument - apparent approval.) Surely there is truth here; it does seem impossible (in a finite time) to walk through an infinitely long tunnel or swim across an infinitely long body of water. But does this help us see why it is impossible for some existing thing simultaneously to depend for its existence on an infinite number of causes? Is there any logical reason to suppose, for example, that there could not be an infinite number of minstrels hierarchically and simultaneously producing one sound? (The sound would be causally related to the minstrels in hierarchical way because if they ceased their causal activity of producing the sound, the sound would cease to exist.) At the very least, it does not seem obvious that this is impossible.

The Thomistic argument that we have been considering does help us to see why Copleston interprets Aquinas as allowing infinite regress in a linear causal series but not in a hierarchical causal series. As noted, I am happy to accept that Copleston interprets Aquinas correctly. But I do not see how Aquinas' argument helps us to solve the purely logical question we are concerned with. Why is it that infinite causal regress of the one sort is logically possible while infinite causal regress of the other sort is not?

III

There does exist what might be called a "standard answer to this question among recent defenders of the cosmological argument. It is an answer that involves a concept not explicitly mentioned in Aquinas' versions of the cosmological argument, viz., the concept of explanation. It is set forth clearly by Patterson Brown and William Rowe. Brown says:

We now ask: what moves a? Well, it has already been stated that b move s a; so, it may be suggested that "b moves a" is the desired explanation of a's motion, the desired value for "x moves a." But this would be an inadequate account of the matter. For b is itself being moved by c, which - owing to the transitivity of "x moves y" - thus yields the implication that a is moved by c, with b

serving merely as an instrument or intermediate. But in turn d moves c; and so d moves a. But e moves d; therefore e moves a. And so on indefinitely. Now, so long as this series continues, we have not found the real mover of a; that is to say, we have not found the explaining value of the function of "x moves a." The regress is thus a vicious one, in that the required explanation of a's motion is deferred so long as the series continues... There would of course be any number of true statements of the form "x moves a" - namely, "b moves a," "c moves a," "d moves a," and so forth. But none of these is to count as the Aristotelian explanation of a's motion. 10

Rowe's version of the standard answer goes as follows: Suppose we are wondering why A exists. Suppose further that A was linearly caused to exist by B and that B was linearly caused to exist by C, etc. Here is a causal series, Rowe says, which might well extend infinitely back in time. This is because we need do nothing other than point out B in order to explain why A exists; although B was itself caused to exist by C, we still need refer no further back than B to explain the existence of A. But, Rowe says, suppose we are trying to explain not why A exists but rather why a certain sort of causal activity - the activity of causing A presently to exist - is going on. Here we cannot as before merely point to B, because presumably B is itself being caused to engage in the causal activity of causing A presently to exist (and is thus only a kind of intermediary). Accordingly, we have to talk about C's causal activity the causal activity of causing B to cause A presently to exist. This, then, is a series that cannot be extended infinitely; this series must have a first member. For if there were no first member, we would never succeed in arriving at an explanation of the existence of the causal activity of causing A presently to exist. We would never be able to explain why this activity is going on.¹¹

One difficulty with the standard answer is an apparent ambiguity in Thomistic explanations of the concept of a hierarchical cause - some interpreters (e.g., Copleston) stress that in this sort of causal series the later members of the series depend on the prior members or their present existence. (Here the terms "later" and "prior" are being used in a logical rather than temporal sense.) Others stress that they depend on them for their present activity. Thus if B hierarchically causes A and C hierarchically causes B, the question is whether, say, B depends on C merely for B's present existence or also for B's present causal activity, which includes the causal activity of causing A presently to exist.

The difficulty here is this: Rowe-type arguments to the effect that we have no proper explanation of some fact if that fact has an infinite number of causal antecedents seem at least at first glance more plausible if both sorts of dependencies are involved (which may have been what Aquinas intended). But then it becomes far more difficult to supply actual examples (known a posteriori) of causal chains where each member depends on the previous member not only for its existence but also for its causal activity, and where we are accordingly entitled to say things like "B depends for B's causal activity of causing A presently to exist on C, D, E, F, and etc., ad infinitum."¹²

But aside from this point we can ask: Is the standard answer a successful argument? I strongly doubt it. It may be true (in some sense of the word "explain") that in a hierarchical series there is typically much more that demands explanation than the mere fact that B causes A. And it is true, in the light of the transitivity of the "is hierarchically caused by" relationship, that C (or any other logically prior member of the series) could equally well be said to be causing A presently to exist. This much of the standard answer seems correct. But why say we have no true explanation of B's causal activity of causing A presently to exist if B is caused to do this by C, and if C is caused by D to cause B to cause A presently to exist, etc.? It is true that we must explain the causal activity of each member of this sort of series via the causal activity of the previous member. But it is surely far too stringent an understanding of the nature of explanation to deny that this counts as a proper explanation. In other words, perhaps we do successfully explain the causal activity of causing A presently to exist when we say that B is causing A presently to exist.¹³ Thus perhaps this series too can be infinitely long, and if so the standard answer fails. < P > In response to Brown's statement of the argument, I do not wish to comment on what counts as an Aristotelian explanation or on whether there is any good reason to suppose that such an explanation must always be available. I do wish to object to the implicit claim that, for example, "B moves A" is somehow not a proper or satisfying explanation of A's motion in those cases where B's causal activity is itself caused. Even if B's moving activity is itself being caused, B is not necessarily a mere instrument of whatever is causing it to move A; B is the cause of A's motion. In other words, the possibility has not been ruled out that in an infinitely long

hierarchical series, each member is indeed causally (and hence explanatorily) efficacious, but receives its causal power from its previous member. "B receives its causal power from C" is consistent with "B is the cause of A." (The staff, for example, really does move the stone - though of course we might also want to know what is moving the staff.) In the end, the standard answer depends on a persuasive definition of the word "explain" - a definition that seems too demanding. Obviously, there are many situations in which explanations are called for, and many sorts of successful explanations. Clearly there are situations involving hierarchical causation where we will accept an explanation of some state of affairs as successful that does not involve reference to the entire causal ancestry of that state of affairs. The cause of the music really can be the minstrel. Thomists at times seem to be pressing the point that in order to be satisfying an explanation must somehow be "total" or comprehensive; I am arguing that in many cases (including cases of explaining the music via the musical activity of the minstrel, and via no logically previous cause) this need not be so.

IV

Neither Aquinas' own argument nor what I am calling the "standard answer" seem successful in validating the claim of Aquinas and Copleston that infinite regress is possible in a linear causal series but not in a hierarchical causal series. Accordingly, for years I was inclined strongly to doubt the frequently-made claim that the cosmological argument is sound when the causality spoken of there is taken to be hierarchical but fallacious when taken to be linear.¹⁴ But further reflection has now convinced me that Aquinas and Copleston were right. Or at least I am convinced that there are versions of the cosmological argument which are clearly fallacious when interpreted in terms of linear causality and at least not fallacious for the same reason when interpreted in terms of hierarchical causality. I will now endeavor to state such an argument.

The argument I shall produce borrows themes from Aquinas' Third Way - indeed, it can be more fairly considered a version of the Third than the Second Way. It does not involve any direct attempt to rule out infinite regress; it makes explicit use of temporal considerations (i.e., it assumes that hierarchical causes exist temporally prior to as well as at the same time as their effects); it argues for the existence of a necessary being (rather than a first mover or first cause); finally, it is - a reductio argument like the Third Way, it aims to reduce to absurdity the claim that all existing beings are contingent beings. It is unlike the Third Way, however, in that it does not try to show that if every existing thing were contingent, nothing would now exist.

The argument begins with five assumptions; let me now state and explain them. ("NB" means necessary being; "CB" means contingent being; and "HC" means hierarchical cause.)

- (1) Every existing being is either a NB or a CB.

Let us say that a contingent being is a being that might or might not exist, and that if it exists, it depends for its existence on another being or other beings that existed before it. Let us say that a necessary being is a being that cannot fail to exist and does not depend for its existence on any other being. Accordingly, (1) is a logical truth, a substitution instance of the law of excluded middle. It simply says that every existing being is either contingent or else is not contingent.

- (2) All existing CBs have HCs.

This would be a difficult premise strictly to prove. It does seem intuitively plausible, however. All the existing contingent beings of which I can think, at any rate, seem to depend on other things for their present existence.

- (3) All CBs are such that they exist at any given time t if and only if all their HCs also exist at t . The truth of this premise follows from the definitions of the terms "CB" and "HC." As noted above, the relationship of "being a hierarchical cause of" is transitive, i.e., if x is HC of y and y is a HC of z , then x is a HC of z .

(4) All CBs are such that at some time they fail to exist, and one of the times they fail to exist is before they exist.

In other words, all existing CBs have finite lifespans; they fail to exist, and then they exist, and then they cease to exist.

(5) There is no first moment of time.

This final assumption entails that prior to the existence of any CB, an infinite amount of time has already elapsed. Two more premises must be stated before proceeding to the logical outworking of the assumptions. The first is the premise which the argument tries to reduce to absurdity, and the second is a premise which is known a posteriori.

(6) All existing beings are CBs.

(7) A given CB, x, exists now.

Let me now state the remaining steps in the argument, with comments later. (After each step I will list in parentheses the premises above it which entail it.)

(8) All of x's HCs exist now. (3, 7)

(9) A given HC of x, y, has existed for an infinite time. (2, 3, 5, 8)

(10) y is a CB. (6)

(11) All CBs begin to exist at some point in time. (4, 5)

(12) At some past point in time y began to exist. (10, 11)

(13) At some past point in time y did not exist. (12, 5)

(14) y has not existed for an infinite time. (13)

(15) y has both existed for an infinite time and has not existed for an infinite time. (9, 14)

(16) (10) and thus (6) are false. (10, 6, 15, RAA)

(17) Therefore, y is a NB. (1, 16)

(18) Therefore, at least one NB exists. (17).

The derivation of premise (9) perhaps requires explanation. One's initial reaction is to ask what rules out the possibility that the causal chain leading to x began with a certain z that came into existence at some point in time - say, in 1940. But what rules out this possibility is the fact that any hierarchical cause of x that began to exist at some past point in time is by premise (6) itself a CB which by premise (2) requires a HC. Thus, given that all existing beings are CBs that require HCs; given that all CBs (including x) have HCs that preceded them temporally; given that since x exists now all of x's HCs exist now; and given that time is infinitely long; it follows that at least one HC of x (viz., y) has existed for an infinitely long time. 15

It should also be noted that the deduction of the incoherent premise (15) does not automatically point to (6) as the premise which by reductio ad absurdum we are allowed to negate. Strictly speaking, what the deduction of (15) entitles us to do is search the assumptions above it for the culprit premise, the one that is responsible for the contradiction. In this case, we must accordingly cast a suspicious eye at each of the argument's assumptions, viz., (1) - (7). Now (7) seems clearly beyond reproach - its status is that of an obvious truth. (1), a logical truth, seems equally acceptable. And it is hard to see how anyone who accepts the suggested definitions of the terms "CB" and "HC" could quarrel with premise (3). Thus the remaining

candidates for culprithood, so to speak, are (2), (4), (5), and (6). I have no great recourse here but to say that I simply opt for (6) as the premise that I deem least plausible of the group and responsible for the contradiction in (15) and that we are by reductio allowed to negate in (16).

V

It is not part of my purpose to insist that the (1) - (18) argument is a successful proof of the existence of God or even of a necessary being. There are other controversial points in the argument beside the one I have been discussing, and I am not able to discuss them in any detail here. For one thing, perhaps premise (2) "begs the question" - a charge that is sometimes brought against the cosmological argument. Maybe if you look deeply enough into the causal ancestry of any contingent being you will eventually arrive at a CB without a HC or without any cause at all. Physicists surely claim that certain events have no cause, in any case. For another, perhaps premise (4) is false because there could possibly exist an everlasting contingent being - a being that could fail to exist but has no beginning, and so far has never failed to exist. Finally, perhaps premise (5) is false; maybe time began, i.e., maybe there was a first moment of time (at the Big Bang, or at the moment of the creation of the world).

Can the (1) - (18) argument at least be said to be a worthwhile piece of theistic apologetics? Possibly I am convinced that the argument does succeed in showing that if premises (2), (4), and (5) are true, then a necessary being exists. And despite their admittedly controversial character, I am also convinced that a strong case can be made for the truth of at least two of these premises, viz., (2) and (5). Of course it may be that the reason I accept (2) is that I already accept (18), so it might be in some sense question-begging for me to use (2) to argue for (18). But (4) seems to me the most problematical premise. I am not aware of any argument that successfully rules out the possibility of an everlasting contingent being.

What I do want to claim is that (1) - (18) argument helps us to see that despite the failure of the "standard answer," Copleston and Aquinas were importantly correct in their claim that infinite regress can be ruled out in a hierarchical series but not in a linear series. Notice that the argument is obviously invalid if we substitute "LC" (linear cause) for "HC" in it. Premises (3) and (8) will be simply false, and (9) will not follow from the premises above it. Why is it, then, that infinite regress is possible in a linear causal series but not in a hierarchical causal series? The crucial difference is that x's hierarchical causes must exist (and exercise causal power) as long as x exists, while this is not true of linear causes. (Aquinas certainly recognized this aspect of the point, although I believe he was mistaken in thinking that infinite multitudes, or an infinite number of hierarchical causes of some effect, had to be ruled out.) Thus, the series of linear causes of x need not necessarily have begun; it is quite possible that the series never began, with all of infinite past time filled up with an infinite number of its members. But the series of hierarchical causes of x is quite different- since one of its members has always existed, the series must have begun with it.

Now as mentioned earlier, I doubt that Aquinas would approve of my method of defending him. For one thing, he would deny both of my assumptions that are noted in note 15, viz., that time is a sequence of discrete moments and that hierarchical causation takes time. More importantly, as a defender of the notion of divine timelessness, Aquinas would deny any claim to the effect that the eternity of God has to do with duration or existence for an infinitely long time. So just because God is the hierarchical cause of the universe, it does not follow (so Aquinas would say) that God must exist temporally prior to the universe.

So in the present paper I have not given Aquinas' reason for affirming the possibility of an infinitely long chain of linear causes and denying the possibility of an infinitely long chain of hierarchical causes. Indeed, I have found Aquinas' reasons wanting. Nevertheless, I believe I have shown that Aquinas and Copleston were aware of something important of which cosmological arguers and theists in general ought to be aware. No hierarchical causal series can regress infinitely; it must begin somewhere.

Notes

1. Thomas Aquinas, *Summa Theologica* (New York: Benzinger Brothers, Inc., 1947), Pt.1, Q. 2, Art. 3. See also *Summa Contra Gentiles*, trans. Anton C. Pegis (Notre Dame, IN: University of Notre Dame Press,

1975), I, 13. (Hereafter references to these two works will be placed in parentheses in the text and will be abbreviated ST and SCG, respectively.)

2. Frederick C. Copleston, *Aquinas* (Baltimore, MD: Penguin Books, 1961), pp. 118-120.

3. See Geach's article, "Commentary on Aquinas," in Donald B. Gifford (ed.), *The Cosmological Arguments* (Garden City, NY: Anchor Books, 1967), p. 60.

4. See, for example, ST I, 7, 4 and 1, 46, 2; and SCG I, 13; I, 69; II, 38; II, 81. See also *De Veritate* II, 10

5. The matter is further complicated by the fact that Aquinas' position seems to have undergone some development during his lifetime. In his later writings he denies that anyone has proved the impossibility of actual infinities. In these writings (see Q.D. de Scientia Dei, Q. 2, Art. 10 and the opusculum *De aeternitate mundi contra murmurantes*) Aquinas wants to argue that it is logically possible that the world has existed for an infinite amount of time, and this seems to him to require the logical possibility that there exists an infinite number of actually existing souls.

6. In the reply to the First Objection in this same article, Aquinas insists that "the infinite in multitude is reduced to act successively and not all at once." And in SCG II, 38 [11], he says: "For, although the infinite does not exist actually and all at one, it can exist successively."

7. This interpretation of Aquinas has two points in its favor. First, it explains something that is at best only implicit in his statements of the first three ways and in crucial texts such as ST I, 46, 2, viz., why he held that infinite regress is possible with one sort of cause but not with the other. Second, it shows how Aquinas can be defended against the charge of contradicting himself in (1) denying the possibility of an infinite multitude, and (2) affirming the possibility of an infinite regress of linear causes. What Aquinas most deeply wanted to deny, in my opinion, was the possibility of an infinite multitude of physical objects existing simultaneously or in some finite period of time. (He also wanted to deny the possibility, as he put it, of "traversing an infinite medium.") So there is no contradiction after all, since linear causes exist successively, and an infinite number of them could exist in infinite time. I included above the phrase "of physical objects" because Aquinas did allow for the possibility of an infinite number of souls existing simultaneously (see SCG II, 81, 9 where he denied that Aristotle successfully ruled out that possibility), but souls are not physical objects.

8. Fortunately there are aspects of it that we can ignore, e.g., the question whether properties of *x* like "is the son of *y*" or "is the father of *z*" are accidental properties of *x*.

9. Almost alone among recent defenders of the Cosmological Argument, William L. Craig argues against the notion of an actual infinite or of infinite regress of any sort. See "The Cosmological Argument and The Possibility of Infinite Temporal Regression," *Archiv für Geschichte der Philosophie*, 59. 3 (1977), and "Wallace Matson and The Crude Cosmological Argument,"

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