The Proof of the First Mover in *Physics* VII, 1

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I'll start by saying what I usually say, which is that I can't give a lecture from the text, just reading it. The first time I gave a large public lecture was at St. John's College in Annapolis. And you're not in an ordinary lecture hall, you're in an amphitheatre. So you've got three hundred and fifty people who are mostly above, looking down at you as you talk, and you see kind of this mass of skeptical and even hostile eyes looking at you. So I shuffled to the lectern and started to read my lecture and before I got very far I realized that I didn't know what I was saying. So I gave up on reading it, and just sort of looked at the paragraphs, glanced at them and then talked on the basis of that. And things went a little bit better. At St. John's you don't get off easy; the question period lasted until two in the morning. I was younger then, so I could stand it longer than I can now. I'm sure you won't be interested in staying that long.

The following is a transcription of the audio recording of this lecture, as Mr. Berquist's illness and subsequent passing, in the Autumn of 2010, prevented his submission of a final version of the essay. It was the last lecture he gave before his death. Mr. Berquist was one of the founders of Thomas Aquinas College, where he was also a Tutor from its beginning. Before that, he was Instructor in Philosophy, St. Mary's College of California, 1959–1963; Assistant Professor, Honors Program, University of Santa Clara, 1963-1966; Tutor, Integrated Curriculum, St. Mary's College of California, 1966–1968; Assistant Professor in Philosophy, University of San Diego, 1968–1972.

In books seven and eight of *Physics* Aristotle considers in a general way movers and mobiles. In particular he maintains that there must be a first unmoved mover, and to support this claim he follows two lines of argument. The first[1] establishes two premises from which he will later draw his conclusion: Everything which is moving is being moved by another, and there cannot be an infinite sequence of moved movers. Each of these premises is supported by three arguments. The second line of argument[2] shows that not every mover is in motion. Here Aristotle does not explicitly argue that everything moving is being moved by another, but assuming that there are mobiles and movers and moved movers, he argues that not every mover can be in motion.

How far do these arguments go in manifesting the truth about the first mover? They show that the mover is either altogether immobile, or moved himself. And if the latter, the mover must consist of a moving part and a mobile part, and the moving part cannot be in motion *per se*. But a further question remains to be considered: Can the moving part of a self-mover be the absolutely first mover, given that it suffers motions *per accidens*, by reason of its substantial union with the mobile part? And in most cases it also comes to be and passes away with that part. So accordingly in the middle of chapter five of book eight[3] Aristotle makes a fresh start, and proceeds to show that the first mover cannot be such as the soul of an animal, which is carried along with its body, but must be altogether immobile, everlasting, of infinite power, and not a body. This is the extent to which the arguments in the *Physics* manifest the first agent cause of motion. This is not, then, the extent to which the character of the first cause can be manifested, but what you can manifest from the

[1] *Physics* VII, 1, and VIII, 5 up to 256b2. [All footnotes have been added by the transcriber.]
[2] *Physics* VIII, 5, 256b2–257a33.
[3] *Physics* VIII, 5, 257a33.

common considerations that are in Aristotle's *Physics*. They will take you only so far.

One would be inclined to add, "And this mover is an intelligent being," for example, but this would be premature. To be sure, it is only reasonable to assume this, because the order and design that we observe in nature indicates an intelligent cause; what is always and everywhere the case cannot be so by chance, and everyone agrees that intelligence is the only *per se* cause of order and design. Yet it would seem that a consideration of the intelligent cause of nature would best be made after a consideration of the intelligence we know first and best, which is our own intelligence. And that's done of course in the *De Anima*, which is a more particular part of natural science, and presupposes the doctrine of the *Physics*.

How do these arguments compare to the "Five Ways"?[4] Only the First Way seems to come directly from the *Physics*, which is based upon motion. The other Ways—the Second, Third, and Fourth—are based on more general considerations: the order of efficient causes, necessary and contingent beings, and the gradations of things according to being, goodness, and truth. Such arguments would seem to belong to a more universal science, like metaphysics, or at least suppose a more thorough knowledge of natural science than you would gather from just the *Physics* by itself. And of course the Fifth Way has to do with the intelligent cause of nature, and perhaps, again, that consideration does not come directly out of the considerations in the *Physics*.

Now, the First Way is taken from the first line of argument I mentioned: Everything moving is being moved by another, and there cannot be an infinite sequence of moved movers. St. Thomas argues the first of those, following one of the arguments in the eighth [book] of the *Physics*, from the defi-

[4] *Summa Theologiae* I, q. 2, a. 3.

nition of motion, so act and potency.[5] The second one he argues from the premise, or the principle, that the intermediate presupposes the first; not every cause can be an intermediate cause. Or, put in concrete terms, not every mover can be an intermediate mover; the intermediate presupposes the first.

Why does St. Thomas select that argument? I think it's fairly easy to see at least a good reason for him doing so. He could have taken other arguments from the *Physics*, but there is a particular aptness to that one. To begin with, the argument that everything moving is being moved by another is based upon the definition of motion, which of course is by what you define nature itself, and in that argument you're giving the reason *why* everything moving is being moved by another. So it's not only an inductive argument, like you have in book eight[6]—which is a good argument, and complete—and yet it's a better argument to argue from the reason *why*, in this case the definition of motion. And the argument he has for the other premise too, St. Thomas says (I think it's in the commentary), is a "more certain" way;[7] the way I'll talk about today, that's in the argument from book seven, is a good way, a sufficient way, but not the most certain way. We'll talk about the reasons for that later. And of course in the *Summa Contra Gentiles*[8] there is a summary of all the principal arguments in book seven and eight for the unmoved mover, including the one that we're going to discuss particularly today, so St. Thomas clearly regards the argument to be a good one. Whether *I* adequately understand that argument myself will become more evident as I proceed, but apparently St. Thomas thinks it's a good argument; he would never have put it in the *Contra Gentiles* unless he thought it was.

Now, in book seven, chapter one, there are two arguments.

[5] *Physics* VIII, 5, 257b2–b11.
[6] Chapter 4.
[7] *In VIII Physicorum*, lect. 2, n. 4.
[8] *Summa Contra Gentiles* I, ch. 13.

Both arguments are based upon a proposition proved in book six:[9] Whatever is movable *per se* is divisible quantitatively, that is to say, into part outside of part. We might note, before we go further, that the whole of book seven is based upon things established in book six. So the first three chapters of book seven are devoted to the demonstration we are going to discuss, which is based upon the divisibility of the mobile. Chapters four and five raise the question of whether, and in what way, or to what extent, motions can have ratios to one another, definite relations according to more and less. So that would right away perhaps warn us that you're not concerned with the question of the unmoved mover in a kind of universal way; you're asking yourself, "From this simple quantitative discussion of motion and the mobile in book six, how much can we tell about the first cause of motion?" Would we be getting the best possible arguments, the fullest possible arguments? Probably not. But, the question is, just given what's established in book six, how far can you go, in the question of movers and mobiles? So his intention there is a limited one, not to cover the whole field, but to show that even in such a relatively straightforward and easy fact—that the mobile is divisible—there are very remarkable and wonderful consequences implicit.

Now, let us proceed. We were saying that all of book seven is based upon book six, but the part we're considering is concerned especially with what comes from the quantitative division of the mobile; in book six that is established in chapter four and then more fully in chapter eight.[10] Before we proceed to analyze the argument for a first unmoved mover in book seven, let us consider briefly the argument that every mobile is divisible. This argument is clearest seen in the

[9] *Physics* VI, 4 and 10.

[10] Probably chapter 10 (240b8–241a27) is meant; chapter 8 is concerned to show that stopping and rest have duration, so that there is no first time of rest or stopping.

case of change of place, and St. Thomas indicates[11] that that is adequate in a way because all the other kinds of change presuppose change of place, and in change of place you find continuity most manifestly, and in the most primary way. The argument can be adapted to other kinds of change, but if we look at it first in terms of change of place, it's possible to avoid side issues that might arise along the way.

The argument, in summary, is: Every change of place is from one place to another. While the mobile is moving it's not in the place *from which*, and it is not in the place *to which*, but *between* those places. But it cannot move at all unless it moves to the *next* place. It may move *beyond* the next place, but any place beyond the next place presupposes that the mobile has moved to the next place, that is, as it were, its first possible destination, that is, the minimal possible motion, so long as the motion belongs to the whole mobile rather than to its parts. But then the question arises, as is obvious, "Where will the mobile be while it's moving from the first place to the next place?" Well, it can't be in the first place, because if it were there, it would not be yet moving. But if it were in the next place, it would already *have moved* to the next place; it wouldn't *be moving* to the next place. So where is it when it's *moving* to the next place? There is only one possible answer: It has to be *between* the first place and the next place. But the only way it can do that is to be partly in one and partly in the other, or have part of itself in one and part of itself in the other. So the mobile must be divisible. (That's something you would perhaps gather from induction. But it's sort of delightful to find so easy and, I would say, conclusive an argument, giving you the reason *why* it must be divisible, why motion *requires* that it be divisible.)

There's a possible objection, however, that occurred to me. Take the other alternative: If the mobile is *in*divisible, will not

[11] *In VI Physicorum*, lect. 5, n. 16.

place be indivisible? And would not motion be motion of an indivisible from one indivisible place to another indivisible place, like of a point moving down a line? We tend to think that a point that moves down a line is moving from point to point along the line. So you could say Aristotle is begging the question; he's assuming that there is a next place. But in order for there to be a next place, the place has to be divisible; but if place is divisible so is the body *in* place. Therefore you're assuming what was to be proved. I found this a very intriguing argument, and I wondered why Aristotle didn't raise it. But let's consider it for a moment just in itself.

Is it possible that there should be motion at all without a next place, on *any* account of motion? Consider for a moment: You leave the place that you're in only by entering another place, and only *insofar as* you enter another place. I don't come to be somewhere else *by* ceasing to be where I am, but conversely: I cease to be where I was by coming to be somewhere else. And this is illustrated in all the other species of change. If you're going to reshape clay, clay does not lose the shape it has except insofar as it acquires another shape. So not only is it simultaneous in time, but also is there a prior and posterior; it's *insofar as* it takes on a new shape that it loses the shape it has. Or how about water ceasing to be cold? Water can cease to be cold only insofar as it becomes hot, and at the same time that it becomes hot. So you can't really avoid the proposition that there has to be a next place, without making matter non-being, as if to say, insofar as you *cease* to be you *come* to be. Which would be a strange way of speaking about the underlying nature; it seems just the opposite: It is insofar as you *come* to be that you *cease* to be what you were beforehand. So there are two ways of describing what happens, and although they are simultaneous in time they are not simultaneous in nature.

So I think you can make, then, the argument that way. You can say, "In order for there to be motion, there has to be a

next place. If the mobile is indivisible, place has to be indivisible. But there can't be an indivisible next to an indivisible." I think that would be a valid argument. But Aristotle chose to assume that, and then to show that, *even granted that*, you couldn't have the indivisible moving. So the alternative view is sort of like what happens in the game of checkers: You can be in the first square, and then the next square; there's no being *between* the squares, so far as the game goes. So in checkers you have a move without any moving. (That's why you can play checkers by mail: You can mark your move for your fellow player, and he can mark his move, and so on.) That's the view of motion I think that Aristotle is explicitly considering there, but it seems to me that the argument could be made either way: Either you grant that there's a next place, then the mobile while moving has to be partly in one place and partly in the other, or you deny that there's a next place, in which case there's another contradiction: You can't move at all, unless there's a next place, unless there's a place that is *immediately ready* to receive you, as well as a place that's further down the line.

It's interesting to note, just in passing, that it seems that the quantities that we make, or invent, they're almost all discrete. Ask yourself, "How long does checkers take, by the clock?" There is no relationship to the clock in that game. The longer game in checkers is the one that has more moves, not the one that takes more time, by the clock. And even in things where there is a certain continuity: speech is a discrete quantity rather than continuous, and baseball breaks down into innings and outs; there's continuous motion within the inning, but the innings themselves are distinct, successive realities, it seems. The end of one inning is not the beginning of the next. But that's kind of by the way.

That being the case, then, let's turn to the argument in book seven, chapter one. The first thing to be established: Everything moving is being moved by another. The argument is kind of by reduction: If not, it has motion simply of itself, and thus has it both *per se* and primarily. To say it has it of itself is to say that its motion does not depend on anything else. Obviously the motion depends upon the mobile; that's the very nature of the case. You at least have material causality there. But if you say a thing is in motion without being moved by another, then it has *no dependence* on anything other than itself for motion. If that's the case, it has to be in motion *per se* and primarily. That it's in motion *per se* is evident. Accidental motion presupposes *per se* motion; a thing is accidentally in motion only insofar as it's *in* what's moved *per se*. Therefore clearly its motion depends upon the motion of something else. My color goes across the room when I walk, and so does my soul. They go only insofar as they are *in* what moves *per se*.

The second condition, "primarily," needs to be clarified. In book five, Aristotle defines "primarily" this way: "not according to accident, not according to part, but according to every part." (St. Thomas's Latin: *secundum quamlibet partem*.)[12] You're moving primarily only if every part of you is moving, and moving not accidentally, but *per se*.

There's another condition that is implicit there—and it's kind of important, I think—that the mobile does in fact leave its place and enter another place. That would exclude the case of rotation, because in rotation every part of the mobile moves, but you still say the motion is a motion according to part, not according to whole, because the whole does not leave its part. So I think you could complete that account by making explicit in it something that is implicit, that the

[12] *Physics* V, 1, 224a27. The transcriber could not find St. Thomas using exactly this expression; rather he says the following: *Tertio modo dicitur aliquid moveri, quod neque secundum accidens movetur, neque secundum partem, sed ex eo quod ipsum movetur primo et per se; ut per hoc quod dicit "primo," excludatur motus secundum partem.* (*In VI Physicorum*, lect. 1, n. 2). The meaning is obviously the same.

mobile must be going from place to place, that whole mobile is moving from place to place, that not just every part of it is moving.

But here "primarily" means something more than what it means in book five; there's an additional condition that its motion does not depend upon anything else's being in motion—*not* that its motion does not depend upon anything else, period, but that its motion does not depend upon anything else's being in motion. To take an analogous example: Fire is hot and water may well be hot, but fire's being hot does not depend upon anything else's being hot, whereas water's being hot does depend upon something being hot. Notice that there's two sides to this: Something *altered* the water and *made it* hot. That's true. But what's the relevant consideration for this argument is just the more simple fact that water cannot possibly be hot unless something else is hot. And maybe the converse is not always going to be the case, but it often happens: Other things can be hot without it being hot. At least that's a possibility in general.

This condition, then, is *necessary* if a thing is to be independently so, but not *sufficient*. So, for example, you could still say that fire is the first of all hot things because its being hot does not depend upon anything else's being hot. But if it follows from the nature of fire, and if the nature of fire is itself something caused, then the heat of the fire does have a cause, a more universal cause: If there's a cause of the nature of fire, it'd be a cause of the heat in the fire. So that's a further condition. But all that's necessary for this argument is this notion that this much at least must be true: If you are *independently* such, you must be *primarily* such. And to be primarily such means that your being such does not presuppose that something else is such, such that if it weren't so, you wouldn't be so. So then, applying this to the present case, if the mobile is in motion primarily, it will be in motion whether or not anything else is in motion; if the stopping of something else involves as its necessary consequence, or immediate consequence, or both, the stopping of this, then it cannot be in motion primarily. So, this is how the argument goes.

When you talk about "something else," you could mean that water is one thing and fire is something else, or this fire is one thing and that fire is something else. But also you have to say that the whole is not the part and the part is not the whole. So the scope of the premise does include any sort of otherness, because it's universal. If something else isn't moving, and the consequence of the something else not moving is that you're not moving, then you're not moving of yourself.

You might say, kind of in passing here, that I would suppose that it would be maintained that a thing that would be in motion *per se* and primarily would always be in motion. It would be difficult to think of it otherwise, that if it might sometimes be in motion and sometimes not, you could always suppose there is some cause of its being in motion. So even in, say, a Newtonian analysis you could kind of imagine a thing could *keep on* moving without anything external moving it, but you don't suppose it could *start* without something else happening to it, if it were at rest beforehand.

So, going back to the premise. If this is right, consider this fact: If the part stops, the whole stops. That's true by the very nature of whole and part. If the mobile is moving and I grab hold of part of it, two things can happen: The other part can break off and keep on moving, or the other part can come to a stop also. In neither case is the whole moving any longer: What is now moving is no longer the whole, and at best only part of that whole. Therefore the ceasing from motion of the whole results from the very fact that the part has ceased to move. But the converse is not true; there might be some cases where you never stop the mobile. But the hypothetical proposition is still true: If the part stops, the whole stops; if the part is not moving, the whole is not moving.

There's a particular understanding of this that's appropriate

to [local] motion also. When the mobile moves it leaves its place part by part. It's not clear in all other changes that the thing changes part by part. If I stick a poker in the fire, it seems the end that's in the fire gets hot first and gradually the heat, so to speak, spreads up the poker to where I can't hold it any longer. But it's not so clear, because, for example, when we observe the freezing of the ice upon the lake, it seems to freeze in layers. So the continuity is not so clear there. Even there I suppose you could say that water freezes part by part, but could there possibly be a first layer of water that freezes all at once? Well, it *looks* that way, certainly. So if we were to go into all the other kinds of change we would perhaps have a much larger scope than what's necessary to make the basic argument about change of place. There it's clear that you can't get all the way out of your place without getting half way out of your place, and you can't get half way out of your place without getting a quarter of the way out of your place, and so on. So there's no *first elsewhere*, so to speak.

So then the argument is: No mobile can be in motion primarily, since it stops moving of necessity when something else stops moving. So the motion of the whole depends upon the motion of the part. And since the mobile is infinitely divisible, no one of the parts can be in motion primarily.

There's sort of an interesting consideration too that's not in the lecture here, but I've thought about it. It seems that when you read Democritus you'd say, "Why are the atoms moving?" And he says it'd be by bumping and knocking. But then you say, "Wait a minute, bumping and knocking presuppose that you're already in motion." Well, he also says that the soul is round smooth atoms. Two things about that are interesting, by the way. First of all, that the soul imparts motion to the body by being in motion itself. That's the assumption he's making. Therefore, to find the origin of motion he wishes, kind of, to discover what is the most mobile of all possible things. But the smaller is the more mobile than the larger, and the round and smooth is more mobile than the thing with angles, and so forth. So he has, as it were, as the primary subjects of motion round and smooth atoms. But he approaches the notion of what could be in motion of itself by approaching the indivisible. And that's a striking thing, because when Aristotle in the sixth book is making the argument that the indivisible can't move,[13] St. Thomas in the commentary says this is against Democritus.[14] When you first read that you say, "But Democritus doesn't say that the atoms are *quantitatively* indivisible, like points—because they have shape—and therefore he does give them a certain size." But I think what St. Thomas is getting at is that supposedly Democritus thinks that if you approach indivisibility, you approach something that is *per se* and primarily mobile. So somehow he sort of recognizes the principle; if you're going to maintain that something has this quality primarily and *per se*, then it's going to have to be an indivisible something. So in a way he bears witness to the premise here, that anything that's divisible can't be primary with respect at least to motion, and perhaps even with respect to those things which depend upon divisibility, like color and heat and things of that sort.

I also noticed, in doing Newton's *Principia*, that he supposes that the forces that are impressed upon a body by being impressed on every particle of a body. And the particles that he's speaking about are particles that are so small that the difference between the front and the back is insignificant. We know that there's the inverse-square law, which of course mathematically gives you infinite gradations of difference, yet he sort of cuts it off at the point where the difference between the front of the particle and the back of the particle (he calls it a "corpuscle") are so nearly together that it's as if they were exactly the same distance from the center of force.

[13] *Physics* VI, 10.

[14] *In VI Physicorum*, lect. 12, n. 1.

So again (without *proving* anything) this sort of indicates a certain sense, on the part of those who think about these matters, that if there was anything that was in motion simply and in and of itself, without depending on anything else, it would be something indivisible. So the closest you can get to the indivisible is the really, really tiny, maybe what they used to call "infinitesimals" in mathematics.

One can see something analogous here in the case of motion, where you can't go all the way without going half the way, and you can't go half the way without going a quarter of the way, and so on. But Aristotle bases his argument on the first and universal cause of the continuous divisibility of motion, which is the continuous divisibility of the mobile. No matter how the mobile is moving, its motion depends upon its divisibility; even if it's just rotating in place, it won't need a distance outside of itself to traverse, yet it has to be divisible. So Aristotle addresses, if you will, the *per se*.

Now, Avicenna objects to Aristotle's argument this way:[15] One cannot assume that in every case the part will be capable of stopping; indeed, if there is a mobile moving primarily and *per se*, then it must always be moving, both whole and part. St. Thomas, in reply,[16] notes that the entire force of the argument is in the truth of the conditional statement, "If the part stops, the whole stops," not on the assumption that in every case it is possible for that part to stop. So the dependence is manifest by the truth of the hypothetical statement, not on the fact that the part actually stops. As you know, an argument can have a necessary premise and a necessary conclusion, but there is still dependence even though both of them are necessarily true. You can see the priority of one to the other, even though both are necessarily true, like the

[15] See *In VII Physicorum*, lect. 1, n. 5, and *Summa Contra Gentiles* I, ch. 13.

[16] *In VII Physicorum*, lect. 1, n. 6, and *Summa Contra Gentiles* I, ch. 13.

priority of the postulates to the theorems. The postulates are necessarily true, and the theorems are necessarily true, but the latter depend upon the former; it's not such that the falsity of the one wouldn't entail the falsity of the other; that's another question. St. Thomas goes further,[17] and states universally that *even the being* of whole depends upon its parts, though of course it need not exist part by part, the way motion does. So that is what Avicenna's objection was and St. Thomas's reply to it.

But another difficulty has been raised: If the mobile is one and continuous, its motion is one; but how can the motion of this actually existing whole depend upon parts that only potentially exist? Should we not rather say that the parts, and their motion, depend upon the whole? Now, if the parts were one only by contact, however tight, it's evident that there would be dependence, since you would have many mobiles and therefore many motions; and it's manifest that a multitude depends upon the units of which it is composed, so if you have a multitude in act, then you've obviously got a dependence of the whole on the part. But where the whole in question is simply continuous, then the matter is not quite so clear.

Nevertheless, is it right to say, without qualification, that because the part does not have a distinct and proper existence, but shares in the being of the continuous whole, it only exists potentially, the way, for example (to use St. Thomas's example), blood exists potentially in bread? (Is bread blood? Well, only potentially.) Are these parts in the whole that way? It seems you've got the presence of the part in the continuous whole is more comparable to the presence of the elements in a compound. Elements do not have their proper existence when they've entered the compound—for then they would only be a mixture. They are present in the compound "in

[17] Ibid.

power," or, as St. Thomas says, "virtually."[18] Thus, we explain some of the attributes of the compound by the attributes of the elements that make it up; for example, the weight of the compound is the sum of the weights of its elements. Recall the definition of an element:[19] It is that from which a thing is first composed, and is *in* that thing. But the element is not in that thing in full actuality. But neither is it simply absent. When water changes into air you don't simply have water anymore; and when water becomes bone you still have water in some way. As St. Thomas says, it's "not totally corrupted."[20] Something of it remains: Its power remains. It's still a principle of the compound even though it does not exist in full actuality when the compound exists.

A similar case is the motion of a projectile. This is a compound motion; it's compounded of the natural downward motion and a uniform lateral motion. These elementary motions are virtually present in the motion of the projectile, and as such they are principles of the projectile motion, and of its properties. Thus, we explain the parabolic path of the projectile from the properties of uniform rectilinear motion and those of natural falling motion, and this explanation gives you the cause. Not only do you establish *that* the path is parabolic, which could possibly be observed, but you show why it *must* be parabolic, from the properties of naturally accelerated motions and of uniform lateral motions.

And a kind of simpler, everyday case: Grey is neither black nor white, yet these colors are virtually present in it and are its principles. Likewise, blue and yellow are principles of the color green.

Finally, to come to the present case, if two short lines be joined together to make a longer, continuous line, their length

[18] See *De Mixtione Elementorum*, lns. 145–153.
[19] *Metaphysics* V, 3, 1014a26.
[20] *De Mixtione Elementorum*, lns. 119–122.

is not destroyed but is virtually present in the greater length. In this respect, the length of the components are comparable to the weights of the elements in a compound; just as the weight of the compound is the sum of the weights of its elements, so the length of the longer line is the sum of the lengths of the shorter lines. Thus, although the parts may be only potentially distinct, rightly understood the motion of the whole still depends upon them. So everything that is moving is being moved by another; or, no mobile is moving entirely of itself.

We can come back to that of course later, but that's as much as I would say in defense of that first step in the argument in chapter one. In other words, the necessity or the need or dependence upon the parts is there whether they exist as parts of a continuous whole or as parts of a contiguous whole. Just as, for example, when you have mobile coming out of its place, it doesn't matter whether it's a continuous mobile or a mobile whose parts are only in contact—they still come out part by part. So whether they be distinct and touching, or they be one continuous whole doesn't really change the fact that you're depending on the divisibility of the mobile.

Let us go on then to summarize the argument that there must, therefore, be a first unmoved mover. This is how it goes: The mover of the mobile will either itself be in motion, or it will not. If it is not in motion, it will be an unmoved mover, and that was to be proved. But if this mover itself is in motion, then it will be moved by another; and if that is in motion, it will be moved by another, and so on. But if every mover in the series is moved, there will be no first; there will be an infinite multitude of movers and mobiles. But since the mover must touch the mobile, and each of the movers, being in motion, has extension, then taken together they will constitute an infinite body. (It may only be an infinite body by contiguity, but still it is an infinite body.) Now, the first

mobile must first go a finite distance. (We began with a consideration of just this thing moving, and then what was moving it, and what was moving it, and so on; but let's talk about the first mobile.) It must first move a finite distance before it moves any further distance, maybe a distance equal to itself. But this will happen in a finite time; it will not take an infinite time to move that distance. But all the other movers and mobiles must move simultaneously in that same finite time. So if I take my hand and I move a book, the motion of my hand and the motion of the book are simultaneous, so if the book moves in a finite time then so does my hand, and in the *same* finite time. So if you have this whole sequence of moved movers, you have each of them moving in the same time. But that means that an infinite mobile must move in a finite time, which was proved to be impossible in book six;[21] there he proved that an infinite mobile can only move in an infinite time. So you have, then, a contradiction: Your mobiles have to move in a finite time, because they have to move in the same time as the first mobile, but it takes an infinite time to move at all. So you move them both for an infinite and a finite time.

Note that Aristotle does not argue that there cannot be an infinite sequence of moved movers. That's another, maybe even better, argument, as St. Thomas says, a *certior via*.[22] But here again Aristotle is arguing from the same given principle: The mobile is divisible. If every mover is a mobile, and they're all touching, then put together they all constitute an infinite extension. Therefore, by the argument in book six, an infinite extension cannot move at all in a finite time.

Now, here's where it gets interesting, where I'm sort of on my own, so I welcome your critique. Why does Aristotle

[21] *Physics* VI, 7, 238a32–b22.
[22] See note 8.

argue the way he does? Why couldn't he argue the way St. Thomas does, very briefly, in the *Summa*,[23] that an infinite mobile can't move? He says that an infinite mobile would fill every place, so you can't move it *anywhere*, since it fills *every* place. St. Thomas says that right out and it seems right to me. I'd say this: If a thing is to move such that every part of it is simultaneously in movement, it's got to be in some place larger than itself; there's got to be all the places of all the parts that they get out of plus some part that they are not out of. So there has to be a place bigger than it, if it's to be in motion all at once. He could have argued even that there's no such thing as an infinite body, whether by continuity or by contiguity, which seems to me to be also part of the argument St. Thomas makes in the *Summa*. He says there's no such thing as an infinite magnitude, nor is there any such thing as an infinite multitude, and he gives universal reasons for that, some of which are metaphysical and some of which are logical. And then he even makes a physical argument, saying that even if you granted an infinite body, it could not move because there's no place for it to go.

These would be good and sufficient arguments, but Aristotle prefers to concede, for now, that there might be an infinite mobile, and only argue that it would take an infinite time to move. You might say that by even talking about the motion of the infinite mobile, as he does in book six, for the time being he does not argue against there being such a mobile. He simply argues that if there were one, it will take an infinite time to move. But later in book six[24] he argues that there's no such thing as an infinite motion. He says there's no such thing as an infinite distance, and [even] *if there were*, nothing would be moving down it. So then he, as it were, rejects, even later in the sixth book, something that he takes hypo-

[23] *Summa Theologiae* I, q. 7, a. 3 and a. 4.

[24] *Physics* VI, 10, 241a27–b12.

thetically at least to be possible earlier on. So you might say in a way that Aristotle's argument is a little bit like the argument for an eternal unmoved mover in book eight, where you say that even if motion is eternal and there are some mobiles that are eternally moving, *even then* there has to be an unmoved mover who is no part of that system. As St. Thomas, that's the "most efficacious way,"[25] because you'd say that if you made *any* kind of argument that there can be motion without an unmoved mover, you're going to maintain an infinite and eternal motion. So by showing that even granted *eternal* motion you must have an unmoved mover, you'd have the most effective way of proving the existence of the unmoved mover. Whereas if you said there was a time before which there was no motion, then the argument is easy and immediate: Obviously you don't go from *no* motion to *some* motion—essentially from nothing to something—without some kind of cause. This is something like that too because you'd say that even *granting* there's an infinite mobile, there has to be an unmoved mover. So he's trying to show, then, as it were, to display the full power of some of the things he proved earlier, which were proved in a certain sense only hypothetically.

So let us proceed. As we were saying, the form of the argument is a reduction to the absurd: If there is no first unmoved mover, there must be an infinite mobile, and this must move in a finite time, the time in which the last mobile moves a finite distance. But, being infinite, it can only move in an infinite time.

What's the argument for the latter? That's in book six, chapter seven. It's interesting how Aristotle argues. He has first of all the case of a finite mobile traveling an infinite space; he says, if the finite mobile travels the infinite space, it will travel it part by part, sort of measuring it as it moves along. Of course, if there is no last part of that infinite space, then there

[25] *In VIII Physicorum*, lect. 1, n. 6.

will be an infinite multitude of finite motions, each of which will take a finite time. Therefore the time to traverse the whole infinite space would be infinite. He doesn't say there is no such thing as an infinite space; rather, he says *let's take* an infinite space, and say you're crossing the infinite space, and you measure it as you go across. It seems there's no greatest multitude of finite times that it's going to take you; so it's going to take you an infinite time to cross the infinite space. Well then, take the other case: Suppose you have a given finite space and you want to move an infinite mobile through it. You do the same sort of thing, in a way, but here you'll move the infinite through the finite part by part. So quantitatively, in terms of time, the two cases are exactly the same; the time it takes the finite to traverse the infinite is the same as the time it takes the infinite to traverse the finite. And of course, if the infinite it going to traverse the infinite, it's going to traverse it finite part by finite part, so it's obviously going to be *a fortiori* in an infinite time. So no matter what particular case you consider, it's going to take the infinite mobile an infinite time to traverse a finite or an infinite distance. Therefore simply speaking the infinite mobile cannot move in a finite time.

Now, the obvious objection is there, probably, in your mind: It will take an infinite time to traverse that distance, just as it takes a longer time for a longer mobile to traverse a given distance than a shorter one; the more cars there are on a train, the longer it takes to come out of the station. So the longer motion {mobile} traverses a given space in a greater time than the shorter mobile. But in the case at hand, it's not necessary that the entire infinite mobile, which the situation involves, has to go through a single finite distance; isn't it enough that *each* part of the infinite mobile go *so far*? So there seems to be a kind of equivocation here on moving of whole and part. If I consider, for example, the train coming out of the station, it comes out of the station part by part. So if I consider the motion of the train with respect to a determinate point, or

a determinate finite distance, like a car-length, then it's clear that the motion of the whole takes more time than the motion of the part. But then if you look back at the train, every car in the train is moving simultaneously. So why could one not say that in the present case you don't have to have every part of this infinite mobile traversing a given finite space? It's enough that each one of them goes only so far. So isn't Aristotle assuming a particular case that here isn't necessarily given? Now, he could go back and say, "Well, there's no such thing as an infinite mobile, or if there were it wouldn't move." But we're *conceding*, for the sake of the argument, that there's an infinite mobile. We're just asking ourselves, How long does it take? The objection is, "Well, once you've granted that it moves, will it not be like a train, where every single car in the train moves at once, no matter how long the train is? Therefore, why does every single car have to pass a given point in order for the train to move at all? All that's required, in this infinite sequence of moved movers, is that they all be in motion at once, not that they all be passing the same spot." So that's the objection to the argument that's given.

This is my answer, and it's a suggestion—I'm not really sure about it. I lay it out for your consideration. Go back to the former statement: If every part of the mobile is to be in motion at once, it must be in a part larger than itself. Well, then, can it be in motion at all? One way it can be in motion is part after part; that is to say, one way it can be in motion is if there is some part of space, if you will, some distance, that's not occupied by it. That means that when this situation begins only part of the mobile will be in place. So the only way for you to move the entire mobile is to move it part by part through that space. So you have, as it were, the first mobile, which is to move so far. Then, if the mobile that's pushing it has to occupy place, it has got to go so far. But only *so much* of the mobile can be in place, because if *all* of it is in place, then there is no place for it to move into. So you cannot really have an infinite mobile moving *at all* except part by part, since it is always going to require empty space, which means that at every stage in the process some part of the infinite mobile has to be not in place. What *is* in place is a finite part, so what looks like, then, another possibility is *not* another possibility in this case.

So instead of arguing, as he might have, that you can't move an infinite mobile all at once, or there's no such thing as an infinite mobile, or there's no such thing as an infinite magnitude (which he might have), he sticks strictly to what he showed earlier in book six, that if an infinite mobile is to move at all, it will move in an infinite time. And what I've tried to do is suggest ways in which that can be made universal, as if to say, if you're going to concede the motion of an infinite mobile, you're going to have to also maintain that not all of it is in place at once, and therefore it moves only part by part. So you have, then, the contradiction: For every part of the infinite mobile to be in motion takes an infinite time, but every part of the infinite mobile must be in motion for a finite time. That's a contradiction, therefore it is impossible, and therefore there must be a first in the series that is not in motion.

In conclusion, I'd like to talk about a few things that have come out of discussions about this matter with friends of mine. First of all, questions do arise about the universal assertion St. Thomas makes that the *being* of any divisible whatever depends upon its parts, for whole and part are said in many ways. An adequate discussion will go beyond the limits of natural science. And within natural science we might ask about those qualities that exist within extension, and are divided according to the divisions of extension, such as heat and color; you have heat only in a body, and if you divide a body, you divide the heat here from the heat there, and you have color only in surface, and if you divide the surface, you have color here and you have color there. Such questions are either too universal or too particular at this point in natural science. Aristotle wants to confine himself to the primary defining feature of the natural, which is motion. As he pointed out, motion depends upon the divisibility of the mobile *in a particular way*, since the mover and the mobile can only leave its place part by part.

One might also argue that of itself it gives little knowledge of the unmoved mover. But this is typical of all arguments from effect to cause. They manifest bit by bit. The Five Ways illustrate this: Each of them gives us something, but together they give us quite a bit. Furthermore, even if all these arguments only show the same thing through a variety of middles, they're all worth doing because our end here is theoretical; we want to understand as well as possible. Thus not only to show *that* it is so with an adequate argument, but to display as fully as possible all the reasons *that* it is so and the reasons *why* it is so.

You see this in Aristotle's treatment of motion earlier in book six,[26] where he gives an argument that is, I think, conclusive that motion cannot consist of indivisible moments; he argues basically that if it did, a thing would *have moved* without ever *moving*. And that's sufficient for the argument, and other arguments which would follow from Zeno's paradoxes would apply there too. But having done that, a bit later he goes on having supposed that there's motion composed of indivisibles he shows that there could be no such thing as speed.[27] Well, what's the point of doing that? You've already shown adequately that motion can't consist of moments. Well, what you're doing is you're displaying *more fully* reasons why that's impossible, starting with another given fact, that motion does have speed. So you're more fully understanding how the continuity of motion is essential to all the things you say about

[26] *Physics* VI, 1, 231b29–232a9.
[27] *Physics* VI, 2, 232a23–233a12.

motion. So where your end is theoretical you're not just satisfied in seeing *that* something is so by an argument that's adequate for that, but you want to see as fully as possible *why* it is so, or at least why there is good reason to think so.

One might ask why St. Thomas does not give this argument in the *Summa Theologiae*. Well, he does, of course, present it in some detail in the *Summa Contra Gentiles*, so he does regard it as valid and pertinent. But in the *Summa* [*Theologiae*] St. Thomas takes only one argument from the *Physics* directly, and it would seem that he selected the best, as we argued earlier; if you had to make a selection, that's the one to select, based as it is on the definition of motion. And furthermore, the First Way can be generalized to apply to *any* sequence of potency and act, whether it be motion in the proper sense or not. If you have a thing being first potential then actual, then potential to a further actuality and then actual, you have a sequence, like in my example of checkers. The First Way can be generalized to apply to cases like that too: The potential never becomes actual except in virtue of the actual, even though there may not be in every case a *process* of becoming. Whereas the argument from the *Physics* VII applies strictly to bodies, but the argument in the First Way can be generalized in a way in which this argument cannot be, because this deals with motion in the strict sense, where the mobile has to be divisible; not everything that has a changeable existence, in the broad sense, is dimensively divided.

A further observation is that both the First Way and the argument from the divisibility of the mobile are more akin to each other than either is to the argument from induction in *Physics*, book eight, chapter 4. For they both give the reasons *why* everything moving is being moved by another; they not only establish the fact but they give the reasons why. So St. Thomas remarks,[28] after defending the argument in book seven, that this is *propter quid*, an argument giving the reason

[28] *In VII Physicorum*, lect. 1, n. 6.

why; it's because you're dealing with a principle that makes motion possible, which is the divisibility of the mobile. You're arguing *per se*.

Also it should be evident from the foregoing that the impossibility of an infinite sequence of moved movers is not *assumed* in the argument in book seven, but proved from another middle term than the one that's used in the *Summa* [*Theologiae*]. We already remarked upon that; this is a different middle term, but the same conclusion. So you can not only argue from the more general premise that not all principles can be intermediate principles, but from the divisibility of the mobile. So it's a less certain, but valid, argument for the first mover; it's not the more certain one, but it is a good one, and, again, it's valuable as part of a more complete display of why there must be a first unmoved mover. If there's more than one reason to be given, since our interest is theoretical, let us have it.

And furthermore, it's proper to natural science. This is a mistake I thought I've sometimes made in class: We talk about the fact that there has to be a first mover if there are intermediate movers, and you tend to kind of diagram that with A, B, C, D, E, regarding each of the stages as if it were a kind of an indivisible. But that's a more universal argument. But *here* you're saying not only do you have a sequence A, B, C, D, and E, but each one of those is divisible and is touching the one next to it. So you're making a proper *natural* consideration of a sequence of movers, and not just considering in the abstract how you might have a chain of causes, because you have that in *all* genera of causes, whether you're talking about the natural or anything else; there is a first material, a first formal, a first agent, and a first end. So here you're getting an argument that comes strictly out of the natural, out of that divisibility of the mobile that makes motion possible.

So finally, this argument gives rise to a certain unique delight. Who would have thought that from the simple proposition that every mobile is divisible—which is evident from induction and can be easily and clearly proved—one might demonstrate the existence of an unmoved mover? You say, How could one get so much from so little? And of course by it, likewise, one begins to approach further conclusions, since it's fairly reasonable that body doesn't move body except by contact and being itself in motion, then the unmoved mover that we were talking about, *even here*, is not a body. So it opens the door to further conclusions as well. But just considered in and of itself it's something kind of wonderful to think that starting from that simple and obvious fact you can prove that there are beings that are not natural beings. It's amazing to me. That's all I have to say.

THE CREATOR IN ARISTOTLE'S *METAPHYSICS*

Michael Augros

For those seeking truth, my topic—what Aristotle thought about God—is a secondary matter, but one worthwhile to the extent that he had theological wisdom to impart. Wonder pursues a worthy object with desire to know it and with a certain reverence—docility, in a similar way, pursues a wise teacher with desire to understand him and with a certain fear of misunderstanding him.

My thesis is that Aristotle held that God is a creator—that God is the cause of the being of all things other than himself, in the mode of an agent, by an act of his will. One must infer this from a careful reading of his *Metaphysics*; it is not simply a matter of pointing to a single explicit and unambiguous passage. In fact, in some passages he seems to say things incompatible with my thesis, which is why the mainstream reading of Aristotle is that his God is not a creator at all.

There are three main "opposition" texts I have in mind:

[1] First there is *Metaphysics* 12.6 and 7, the principal place in all his writings where Aristotle forms a distinct argument for the existence of God—but there he appears to argue to God only as a cause of the existence of motion, not as a cause of the being of things, let alone as the cause of matter.

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