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Does Efficient Causation Presuppose Final Causation? Aquinas vs. Early Modern Mechanism

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Aquinas embraced the bold claim that there can be no efficient causation without final causation—therefore, there can be no movement from one place to another without a final cause. Early modern philosophers responded with a tough counter-example: inertial motion, which apparently has no final cause. This helps to explain how early modern philosophy defeated Thomism, the last gasp of Aristotelian teleology in physics—or at least many people think that it does. But this familiar tale of triumph assumes a specific reading of Aquinas’s understanding of final causation as well as a specific reading of the early modern alternative.¹ I shall argue against both, and in so doing will try to make the case that Aquinas’s argument succeeds, given a stripped-down understanding of final causation that is sufficiently robust to be of philosophical significance and that should prompt us to reconsider our current understanding of what counts as a teleological explanation.

Aquinas offers a short argument setting out his view in *Summa Theologica*, IaIIae, Q1, a2.

Matter does not attain form except insofar as it is moved by an agent, for nothing brings itself from potency to act. But an agent does not move except from intention of an end; for if an agent were not determined to some effect it would not do this

¹ This introduction is almost entirely the work of Bonnie Kent.

rather than that. Therefore, to produce a determinate effect it must be determined to something certain which has the nature of an end.

I take Aquinas to be arguing as follows. In order to do anything an agent has to do something in particular. But an agent can do something in particular only if it is determined to one particular thing as opposed to some other particular thing. And to be determined to a particular thing is to have that thing as an end. So the idea here is that efficient causation requires that the cause be determined to a particular effect, which in turn entails that the cause has that effect as an end.

It is important to be clear that when Aquinas describes a cause as being determined to a particular effect he is not implying that it is determined that the effect will occur. So he explains elsewhere that

in inanimate beings, the contingency of causes arises from imperfection and deficiency: because by their nature they are determined to one effect, which they always produce, unless there be an impediment due either to weakness of power, or some extrinsic agency, or indisposition of matter. For this reason natural causes are not indifferent to one or other result, but more often produce their effect in the same way, and seldom fail.²

So accidents can happen. An agent can intend one end and yet some other effect results. But the point is that in order to do anything at all, even something unintended, the agent has to be intending something in particular.

It is also important to understand what Aquinas means when, in the original quotation, he links the notion of a cause being determined to a given effect with its intending that effect. By intending an effect, Aquinas means tending to that effect, as is made clear in another passage in which he asserts that both the action of the agent bringing about the change (the mover) and the movement of the patient undergoing the change (the movable) *tend* to the end:

Intention, as the name indicates, signifies tending to something. Now both the action of a mover and the movement of the movable tend to something. But it is due to the action of a mover that the movement of the movable tends to something. Hence intention primarily and principally belongs to the one that is the mover to an end. . . .³

² *Summa Contra Gentiles* (SCG), 3a, ch. 73.

³ *Summa Theologica*, IaIIae, Q12, a1.

Furthermore, he asserts even more clearly in *De Principiis Naturae*, chapter 3 that: ‘Therefore it is possible for a natural agent to intend without deliberating about it. To intend in this way is nothing more than to have a natural inclination toward something.’ So Aquinas’s view, as I read him, is that the fact that something tends to some particular effect rather than another is sufficient for that effect to count as an end.

There is no explicit requirement in Aquinas’s argument that the end be an endpoint or terminus. There is no requirement that the end be something good. There is no requirement that the agent act for the sake of the end or in order to achieve the end. There is no suggestion that the agent’s doing something now is explained by the fact that it will lead to some future outcome. Instead, Aquinas is arguing that if cause C is determined to a particular effect E as opposed to some other particular effect, then that by itself is sufficient for E to have the nature of an end. Thus I would infer from this argument that at its core the notion of final causation for Aquinas does not depend on the assumption that motion or change presupposes an endpoint or terminus, nor does it depend on the end being good, nor need there be a purpose. Aquinas’s point as I read him is that in virtue of being determined to a particular effect an efficient cause is aimed at that effect rather than other effects.

One might well object first that it is built into the very notion of final causation that there be an end that is a good or at least whose achievement counts as a purpose; and, second, that surely Aquinas links the notion of final causation not only to an end that is a good but also to its being constitutive of an end that there be an intelligence that intends it. In response to these objections it is crucial to distinguish in Aquinas between his full-bodied notion of final causation and his core notion. This distinction is implicit in the argument from the *Summa Theologica* on which I am focusing, but it is revealed much more clearly in chapters 2 and 3 of Book IIIa of the *Summa Contra Gentiles*. In the second chapter he argues that every agent acts for an end. In the third chapter he argues that every agent acts for a good. Thus he clearly thinks that the notion of acting for an end is logically prior to that end’s being a good.⁴

In addition to the evidence from Aquinas’s argumentation in the *Summa Contra Gentiles*, my claim that Aquinas’s core notion of final causation is

⁴ I am indebted to Bonnie Kent for this point.

this stripped-down version is also partly based on the assumption that the most fundamental feature of final causation for Aquinas is that it is the most fundamental of the four causes. And it would seem that in order to establish that efficient causation presupposes final causation he needs to have a stripped-down version of final causation. Were it essential to final causation that the end be an endpoint, a goal, or a good, then it is hard to see that a plausible argument could be generated to show that efficient causation presupposes final causation.

To provide some perspective on my strategy for understanding Aquinas's account of the relation between final and efficient causation, it is worthwhile to consider a rival strategy. John Carriero agrees with me that the most fundamental feature of final causation for Aquinas is that it is the most fundamental of the four causes.⁵ However, his response is the exact opposite of mine. While I am proposing that in order to make sense of this view we should interpret Aquinas as relying on a stripped-down notion of final causation that I am calling his core notion of final causation, Carriero proposes that we interpret Aquinas as having a souped-up version of efficient causation.⁶ Even though our strategies are opposed, I'm sympathetic to his approach and find what he says highly illuminating. It seems to me that when confronted with an argument for such a basic and yet foreign-sounding claim, such as the claim in question that efficient causation presupposes final causation, one can learn by pushing it in different directions. I hope that the way I am pushing it will also turn out to be productive.

In Carriero's view, Aquinas's notion of efficient causation is souped up because Aquinas thinks all causation requires first, that there be a movement from potentiality to actuality; second, that the effect the actuality produced be a terminus or endpoint;⁷ and third, that the endpoint be a good.⁸ In making such an argument Carriero is clearly appealing to Aquinas's full-bodied notion of final causation. Now I have argued that Aquinas's core notion of final causation does not require that the end be a good. However, I would argue further that the very passage from Book 3a, ch. 2 of the *Summa Contra Gentiles* that Carriero cites in support of the first two constraints shows that even Aquinas's full-bodied conception of

⁵ John Carriero, 'Spinoza on Finality Causality', in Daniel Garber and Steven Nadler (eds.), *Oxford Studies in Early Modern Philosophy* (New York: Oxford University Press, 2005), ii, 113.

⁶ *Ibid.*, 106, 121.

⁷ *Ibid.*, 109.

⁸ *Ibid.*, 115.

final causation allows exceptions to the second. That is, Aquinas does not require that the end be an endpoint.

For in those things which clearly act for an end, we declare the end to be that towards which the movement of the agent tends: for when this is reached, the end is said to be reached, and to fail in this is to fail in the end intended; as may be seen in the physician who aims at health, and in a man who runs towards an appointed goal. Nor does it matter, as to this, whether that which tends to an end be cognitive or not: for just as the target is the end of the archer, so is it the end of the arrow's flight. Now the movement of every agent tends to something determinate: since it is not from any power that any action proceeds, but heating proceeds from heat, and cooling from cold; wherefore actions are differentiated by their active principles. Action sometimes terminates in something made, for instance building terminates in a house, healing ends in health: while sometimes it does not so terminate, for instance, understanding and sensation. And if action terminates in something made, the movement of the agent tends by that action towards that thing made: while if it does not terminate in something made, the movement of the agent tends to the action itself. It follows therefore that every agent intends an end while acting, which end is sometimes the action itself, sometimes a thing made by the action.

The cases that do not meet Carriero's second constraint are cases such as understanding and sensation where the end is the action itself. Aquinas contrasts these cases with those in which the action terminates in something made. Elsewhere Aquinas draws a similar distinction between the sun's shining (*lucere*), which he says is an operation that remains in the sun, and the sun's illuminating (*illuminare*), which he says is an action that goes out to an exterior thing and changes it.⁹ What he has in mind is Aristotle's distinction between activities on the one hand and changes or motions on the other. It is only changes or motions that have an endpoint, but it doesn't follow that an activity is not itself an end, even if it has no endpoint.

In light of the evidence first, that Aquinas does make use of a stripped-down notion of final causation in arguing that efficient causation presupposes final causation, and second, that even his full-bodied notion of final causation does not require the second constraint attributed to it by Carriero, I think we can safely pursue my approach without fear

⁹ Aquinas, *Disputed Questions on Truth*, i, Q8, a6.

that is it entirely lacking plausibility. It is thus Aquinas's core notion of acting for an end that is logically prior to that end being a good that I want to consider in relation to early modern mechanism.

If Aquinas's argument, as I have construed it, works, then it would seem to be relatively easy to show that all locomotion involves final causation. First, something cannot move unless it moves in a determinate direction. Moreover, something cannot move in a determinate direction without being determined to that direction.¹⁰ But to be determined to a determinate direction is to have that direction as an end. Thus all locomotion is teleological. Second, following Descartes and Newton, we still endorse the view that a body moving in a given direction has a tendency to continue to move in that direction. But, if Aquinas is right, to tend to move in a given direction is to have motion in that direction as an end. So there are really two considerations at work here. The first is that the linking of the action of an efficient cause with a particular effect as opposed to other particular effects entails that the effect is an end. The cause, in virtue of being determined to a given effect, is aimed at the effect. The second is that some effects themselves involve tendencies. Inertial motion involves a tendency not in the sense that a body tends toward an endpoint or terminus, but that it tends to one direction rather than another.

What shall we make of this argument? Inertial motion is not now, nor was it by its initial proponents, considered to be teleological. Indeed, one might well be inclined to think that the introduction of the notion of inertial motion in the seventeenth century was the key element in the demise of Aristotelian teleologically based science. One might defend this view by arguing that inertial motion involves a mere tendency to move in a given direction, and a tendency is not by itself sufficient for the existence of a final cause. Instead, the existence of a final cause requires more than a tendency to a certain outcome, it requires, at the very least, striving for a certain outcome. We might put this point making use of the notion of aiming. I have attributed to Aquinas the view that a cause is aimed at a given effect so long as it is determined to that effect, that is, that it tends to

¹⁰ To avoid complications I am assuming what Aquinas would consider the normal case in which there is no impediment. To cover the complete range of cases this premise would have to be revised to read 'something cannot move in a determinate direction without being determined to some direction or other'.

that effect, but one might reply that a cause is not aimed or is not aiming at a given effect unless it is striving towards it.

Let me cloud the waters, if they aren't cloudy already. If we look at the views of Descartes, Newton, and Spinoza, it is very hard to ascertain first, what sort of distinction they drew, if any, between the notions of tending toward and striving toward, and second, if they did draw such a distinction, whether they would have denied that bodies strive to maintain rectilinear motion. The primary source of the mystery is the phrase *quantum in se est*. Descartes makes use of it in formulating his law of inertia; he is followed in this by Newton, and Spinoza uses it in his doctrine of universal conatus.

Each thing, in so far as it is simple and undivided, always remains in the same state, *quantum in se est*, and never changes except as a result of external causes.¹¹

The *vis insita*, or innate force of matter, is a power of resisting, by which every body, *quantum in se est*, continues in its present state, whether it be of rest, or of moving uniformly forwards in a straight line.¹²

Each thing, *quantum in se est*, strives to persevere in its being.¹³

The phrase is obviously intended to do some important work. But what? It gets translated in various ways, which makes it all the more difficult to understand what work it is supposed to be doing. The most literal translation is 'in so far as it is in itself'. One common translation is 'in so far as it can be by its own power'. I. Bernard Cohen has made a powerful case, however, that it is best translated as 'according to its nature'.¹⁴ All three of these translations suggest that there is something internal to the thing in virtue of which it remains in its same state or, in the case of Spinoza, perseveres in its being.

It is important to emphasize here that Descartes is widely misread as supposing that there is nothing internal to a body in virtue of which it continues in the same state, and as thinking that there is no sense in which bodies are active. Instead, these tendencies can be explained entirely by reference to God's will without attributing force or anything else internal to bodies. Explicit evidence that Descartes thinks we do need to attribute a

¹¹ *Principles*, ii. 37; AT, viiia, 62; CSM, i. 240–1.

¹² *Principia*, C i. 2, Definition III. ¹³ *Ethics*, iii. P6.

¹⁴ I. Bernard Cohen, "'Quantum in se est': Newton's Concept of Inertia in Relation to Descartes and Lucretius', *Notes and Records of the Royal Society*, 19 (1964), 131–55.

force internal to bodies to account for their behavior is found in a neglected passage from his correspondence. In a letter to Mersenne, dated 28 October 1640, he states:

He [Father J. Lacombe] is right in saying that it was a big mistake to accept the principle that no body moves of itself. For it is certain that a body, once it has begun to move, has in itself for that reason alone the force to continue to move, just as, once it is stationary in a certain place, it has for that reason alone the force to continue to remain there. But as for the principle of movement which he imagines to be different in each body, this is altogether imaginary.¹⁵

This passage makes it clear that Descartes's objection to Aristotelian internal principles of movement in bodies is not that he thinks bodies have no internal tendencies, but rather that in failing to recognize that all matter has the same nature the Aristotelians have failed to recognize that all matter in motion has the same one tendency—namely, to continue moving in a straight line.¹⁶

Is the phrase '*quantum in se est*' doing more work than indicating that there is an internal source of a thing's preserving its state? The 'in so far as it can' translation, at least to my ear, suggests that the thing is striving. So if that is the best translation, then it would imply that both Descartes and Newton thought that inertia does involve a body striving to maintain its present state. But, if instead, 'according to its nature' is the best translation, so that what is being claimed is that a body remains in the same state because of its nature, it seems less clear that striving is involved, although, on the other hand, I do not think that striving is being excluded. If by 'nature' what Descartes and Newton have in mind is an innate or natural force, so that it is in virtue of an innate or natural force that a body preserves its state, then it is tempting to think that in acting a body is making an

¹⁵ AT, iii. 213; CSMK, 155.

¹⁶ It is important to distinguish between natural tendencies and internal tendencies. According to Descartes the only natural tendency bodies have is the general tendency to remain in their same state. This is why a body at rest tends to stay at rest and a body in motion tends to continue moving. Descartes thinks that a body in motion tends to continue moving in a straight line because all motion is rectilinear. But, since neither being at rest nor being in motion is natural to a body, the determinate tendency of a resting body to stay at rest and that of a moving body to continue moving, while internal to the body, are nevertheless not natural. This has the important consequence, pointed out by Jeffrey McDonough, that according to Descartes's system we have to observe a body's current state in order to ascertain its determinate tendency. This contrasts with the Aristotelian system according to which knowing a body's nature is sufficient to ascertain its determinate tendency.

effort, that is, striving. However, this cannot be what Newton has in mind, because he explicitly identifies the force of inertia with the ‘inactivity of the mass’.

Michael Della Rocca has made a convincing argument that the phrase ‘*quantum in se est*’ as used by Descartes is meant to flag the notion of striving. He notes various passages in which Descartes uses the Latin equivalent of ‘strive’, and its variants, as a substitute for the phrase ‘*quantum in se est*’. So, for example, Della Rocca quotes the following passage:

When I say that the globules of the second element strive (*conari*) to move away from the centres around which they revolve, it should not be thought that I am implying that they have some thought from which this striving (*conatus*) proceeds. I mean merely that they are positioned and pushed into motion in such a way that they will in fact travel in that direction, unless they are prevented by some other cause.¹⁷

Della Rocca goes on to argue that Descartes is offering a deflationary account of striving, that is, he argues that the notions of striving and tending are equivalent for Descartes.¹⁸ I think this is a mistake. It seems to me that striving for Descartes is more than mere tending, it is tending in which there is an internal source of the tending. That is, only if something tends *quantum in se est*, is it striving. To elaborate, I would argue that it is not sufficient for the source of body B’s tending to x to be internal that its current state s is such that it will do x unless prevented. Admittedly in that case B’s doing x is a function of its being in internal state s, but I think the crucial question is, what accounts for that function’s holding? If it is the case that it is entirely due to God’s action that B’s being in s results in its doing x, then I would say the source of the tendency is external. As far as I know, Descartes never mentions this scenario, but I see it as lurking in the background. In my view the source of the tendency is internal only if something internal to the thing contributes to the explanation of why its doing x follows from its being in internal state s. That is, I want there to be something internal to the thing that looks like a force or efficient cause. So it is in this latter scenario that I think there is striving

¹⁷ *Principles of Philosophy*, iii. 256; AT, viiia. 108; CSM, i. 259. See Michael Della Rocca, ‘Spinoza’s Metaphysical Psychology’, Don Garrett (ed.), *The Cambridge Companion to Spinoza* (Cambridge: Cambridge University Press, 1996), 195.

¹⁸ Della Rocca, ‘Spinoza’s Metaphysical Psychology’, 195–6.

on the part of the body, but not in the former scenario where God is doing all the work of taking the thing from the internal state *s* to the doing of *x*.

One might object at this point that striving involves conscious effort, or, at least, one might object that Descartes thought striving involves conscious effort, so that in explaining what he means by striving—that bodies ‘are positioned and pushed into motion in such a way that they will in fact travel in that direction, unless they are prevented by some other cause’—Descartes is not offering a deflationary account of striving, but rather an eliminative account. And it might be claimed that textual evidence to support this eliminative interpretation is found in his argument for rejecting the Aristotelian account of gravity:

But what makes it especially clear that my idea of gravity was taken largely from the idea I had of the mind is the fact that I thought that gravity carried bodies towards the centre of the earth as if it had some knowledge of the centre within itself. For this surely could not happen without knowledge, and there can be no knowledge except in a mind.¹⁹

Certainly Descartes is asserting here that an internal force cannot carry a body to an endpoint without knowledge of that endpoint. But is he also asserting that to suppose there is a force in a body carrying it in a straight line also implies that the body has knowledge? I do not think he is making this further assertion. So I read Descartes as maintaining that as long as there is a force in a body in virtue of which it tends in a certain direction, that is sufficient to say it is striving. That is, I think his considered opinion is that striving need not arise from thought.²⁰

This argument that inertial motion as conceived at least by some early modern mechanist philosophers involves striving could be taken to have completely opposite implications. On the one hand, it might be taken to

¹⁹ AT, vii. 442; CSM, ii. 298.

²⁰ So in the passage discussed above in which Descartes asserts, ‘When I say that the globules of the second element strive (*conari*) to move away from the centres around which they revolve, it should not be thought that I am implying that they have some thought from which this striving (*conatus*) proceeds. I mean merely that they are positioned and pushed into motion in such a way that they will in fact travel in that direction, unless they are prevented by some other cause’. I take him to be arguing only that striving does not require thought. I do not read him as making the further argument that the globules can still be said to strive even if the explanation of why they will in fact continue to travel away from the centers if not impeded need not invoke a force internal to the globules.

show even striving for an end is not sufficient for final causation. I will return to this issue later. On the other hand, to someone committed to the view that striving for an end is sufficient for final causation, it might be taken to show that Descartes is wrong to conclude that inertial motion does not involve final causation. I am inclined to think that Aquinas would say that Descartes was wrong to conclude that inertial motion as he conceived it does not involve a final cause, at least understood according to the stripped-down core notion. To elaborate, it does seem plausible to argue that in conceiving inertial motion as something that does not have an endpoint, the early modern mechanist philosophers conceive of it as what the Aristotelians would have considered to be an activity rather than what they would have considered to be motion. That is, they have assimilated inertial motion to activities such as sensing and understanding and shining insofar as none of them has an endpoint. But, as noted above, it does not follow from that transformation that inertial motion lacks the character of being an end.

Still another response would be to argue that in spite of Descartes's references to forces in bodies and Newton's use of the term 'force of inertia' (*vis inertiae*), which is considered by many to be a contradiction in terms, and in spite of their common use of the expression *quantum in se est*, the real significance of the introduction of the concept of inertia is that the continuation of motion does not require a force at all. Only changes in motion require forces. That is, it is not that the continuation of rectilinear motion is being reconceived so that it is viewed as an activity rather than as a change, but rather it is being reconceived as a state, on a par with a thing's shape. And just as no efficient cause is required for something to maintain its shape (in the absence of external forces), no efficient cause is required for something to maintain its state of rectilinear motion in the absence of external forces. Furthermore, to say that inertial motion does not require a force is tantamount to saying that it does not require an efficient cause. So the case of inertial motion is not really relevant to the question of whether efficient causes presuppose final causes.

In light of these various responses, especially the last one that inertial motion as conceived by Descartes and Newton has no efficient cause, I suspect that many readers will find it inconclusive whether inertial motion constitutes a counter-example to Aquinas's claim. Perhaps it would be better to focus on cases of change of motion, which are cases in which force

does come into play and which are still considered by most contemporary philosophers, I presume, not to involve final causes.

Newton's other main concept of force, besides the force of inertia that is innate to the moving body, is the force proportional to a change in motion. He refers to this force as impressed force. It would appear to be external to the moved body in its origin, since it is defined as an action exerted on a body. I have to confess that I do not have a very good understanding of this notion of force, but I don't think we think of this force, this action, as having any connection with the notion of striving. However, it is interesting that Newton himself defines the force as being 'exerted upon a body, *in order to change its state*' [*Vis impressa est actio in corpus exercita, ad mutandum eius statum vel quiescendi vel movendi uniformiter in directum*] which certainly seems to have a teleological ring to it. It is also noteworthy that Newton asserts that 'this force consists in the action alone and does not remain in the body after the action'. Since Newton identifies the action with the impressed force, and impressed force was understood to be a force received in the moved body, the strong suggestion of these remarks is that Newton views the action that brings about motion as being located in the moved body rather than in the agent causing the motion. So Newton's account of impressed force has two Aristotelian echoes. The first is that the action has a purpose and the second is that the agent's action is located in the patient, that is, the thing acted on. Still, even if Newton was thinking of impressed forces along Aristotelian lines, we do not think of forces in that way. We do not think of them as actions located in the moved body nor do we think of them as exerted in order to do something.

Nevertheless, I think we do think of impressed forces as having determinate effects that we can specify. So this brings us back to Aquinas's original argument. Is the mere fact that we can specify these effects sufficient to make them ends and thus to justify Aquinas's view that efficient causation presupposes final causation?

Perhaps what is at stake is the underlying explanation of why something is determined to one effect rather than another. That is, what is at stake is what underlies the laws of nature. There would seem to be three possibilities. One is that adopted by Spinoza, that effects follow from causes by a kind of conceptual necessity in the same way that properties of a triangle follow from its essence. On such a picture it does not seem unreasonable to deny

that the cause is aimed at the effect. However, it is not clear to me that on such a picture we have to deny that the cause is aimed at the effect. If the cause is, as it were, locked into the effect as a matter of conceptual necessity, why not say it is aimed at the effect? It might seem odd, however, on such a picture, to characterize the cause as striving toward the effect. If it is a matter of conceptual necessity that cause C is directed to effect E, that it will tend to have E as a result, that is, in the absence of other countervailing causes E will occur, then there does not seem any need for striving. But this points at most to an inconsistency in Spinoza, for whom striving plays a central role,²¹ and not to a real philosophical problem for the view that a cause can be said to be aimed at an effect to which it is connected by way of conceptual necessity. In any case, it is a very uncommon view, unfashionable since Hume, to think that there could be a conceptual connection between cause and effect.

Second, one might think, as did Leibniz, that there is an author of nature who has forged the connections between cause and effect and that there is a sufficient reason for the connections being made as they are. This of course would be a teleological conception, and, in Leibniz's case, since the reason has to do with its being the best of possibilities, it is teleological in the fullest sense.

Third, one might think that it is a matter of brute fact, not subject to further explanation, that the fundamental laws of nature are as they are. And one might try to argue further that if it is merely a brute fact that any cause C is connected to an effect E, then there are no final causes. However, I'm tempted to think that at least part of the point of Aquinas's argument is to undercut this last move. Even if it is nothing but a brute fact that cause C is connected to E, the mere fact that C is connected to E rather than to E' entails that C is aimed at E. So the idea is that being aimed at an effect is sufficient for final causation; it is not necessary that the cause strive towards that effect.

Now suppose we grant that Aquinas is right and we can admit that every cause is aimed at an effect and in that sense the effect is an end, and so in that minimal sense of final causation, efficient causation presupposes final causation. Does such a stripped-down notion of final causation have any

²¹ Michael Della Rocca has pointed out that we need not suppose that Spinoza is being inconsistent. We could argue in his defense that the fact that things strive to persevere in being is indeed part of the explanation of why effects follow by conceptual necessity.

philosophical interest? I think it does. I think it is a significant insight on Aquinas's part that specification is equivalent to aiming, in other words, to specify a cause's effect is tantamount to saying that the cause is aimed at the effect, and it really does not matter whether there is an explanation underlying the specification or whether it is simply a brute fact. I am suggesting, in other words, that one lesson of Aquinas's argument is that we are mistaken in thinking that there is nothing teleological about laws of nature that say that cause C will result in effect E, other things being equal. The sort of tendency expressed by such laws has the implication that C is aimed at E, and that is sufficient to give the laws a teleological character.

This, of course, is an extremely controversial claim. Many contemporary philosophers would in contrast cite the behavior of a heat-seeking missile as behavior that is genuinely teleological, on the ground that teleology requires that something reorient itself to its target if it is knocked off course. On the weak view I am deriving from Aquinas, a thing's behavior has teleological character provided only that it would act in a certain way provided nothing interferes (or, alternatively, a causal sequence counts as teleological so long as the cause would have a given effect provided nothing interferes). I do not have a further argument to confront skeptics who doubt that this sort of conditional is sufficient to ground the claim that the thing is aimed at that sort of behavior (or that the cause is aimed at the effect). But I am inclined to think that what is needed here is not further argument, but rather, as happened to me, a gestalt shift.

Aquinas commits himself to the stronger view that a cause is determined to, that is, is aimed at a given effect only if it almost always achieves that effect. But that condition seems unnecessarily strong. Rather, what seems correct is that a cause is determined to or aimed at an effect provided that the effect would come about 'unless there be an impediment due either to weakness of power, or some extrinsic agency, or indisposition of matter'. And it seems that it could happen that a cause is determined to a given effect even if there is an extrinsic agent that interferes most or perhaps even all of the time, because the cause would have achieved the effect had there been no such impediment.

What would count as a counter-example to Aquinas's claim that efficient causation presupposes final causation on this stripped-down core notion of

final causation? It would have to be a cause such that it is not true that the specified effect would come about unless there were an impediment. In other words, the specified effect might not come about even if there is no explanation for its not coming about. What this shows, I think, is that if we grant to Aquinas the principle of sufficient reason construed in the non-teleological sense that we must be able to give an efficient causal explanation for everything that happens, then he is home free.

One question that has come up is whether indeterministic motions such as one might find in quantum mechanics or completely random motions would count as counter-examples to the view that all motion requires that something is being aimed at. I am not sure what to say about these cases. In regard to the case of indeterministic motions, it is not entirely clear to me that a cause has to be aimed at a single effect in order to count as being aimed. So suppose that a cause (independently of any other causal influences) has various incompatible effects distributed over a probability space. I don't see why we should not say that it is aimed at all these various effects.²² Aquinas himself would not be satisfied with this response. His view is that if a cause is going to act, it cannot be indifferent to two or more effects, but a cause whose probability space included two incompatible effects each with 50 per cent probability would seem to be indifferent between them.²³ What this reveals, perhaps, is that if we are willing to say that an indeterministic cause is aimed at its various effects, then that notion of being aimed is weaker than Aquinas's notion of a cause being determined to a particular effect because Aquinas's notion of determination precludes indifference. In regard to the second case of completely random motion, one might still try to argue that aiming is not even lost here. It seems correct both that something cannot move without heading in some direction or other and that to be headed in a direction is to be aimed.²⁴

One objection that has been made is that it is impossible to sustain the distinction I have tried to draw between those effects that are aimed at and those effects that are merely the accidental result of the interaction of various causes individually tending to or aimed at other effects. So, for example, if body A is tending in a certain direction and body B is tending

²² I am indebted here to Robert M. Adams.

²³ See SCG, 3a, ch 2.

²⁴ I am indebted here to Bonnie Kent.

in another direction, I have wanted to say that A's collision with B might be accidental and not something either is aiming at. But one might argue that from the broader perspective of the system containing A and B, since they would collide provided no other causes intervene, their collision is something that is aimed at.²⁵

I am prepared to grant that what is accidental from the point of view of one agent might not be accidental from a more encompassing perspective involving many agents, and that there might be some comprehensive perspective from which nothing is accidental. A similar issue was of concern to scholastic Aristotelians. As Dennis Des Chene has noted, neither the principal cause (the father) nor the impeding cause was thought to intend the production of a monster, but Nature understood as the total cause was thought to intend it because it inclines towards it.²⁶

None of this discussion is to deny that there are other richer conceptions of final causation and that other discussions of final causation tend to focus on these richer accounts. I've been arguing that in a minimal but still perfectly good sense final causation is present whenever the cause is aimed at the effect. In a stronger sense of final causation, the cause is not only aimed at the effect, but it strives for the effect. In arguing that Spinoza advocates final causation in still another stronger or richer sense, Don Garrett has asserted, in the tradition of my colleague Larry Wright,²⁷ that an explanation of a thing's behavior B is teleological if B's origin or etiology is explained by its having as a usual or expected outcome O. Garrett claims that Spinoza is committed to such explanations, for example, that humans develop with sharp teeth in front so that they can tear food. In such a definition an explanation would count as teleological even if the notion of striving plays no role in the explanans. Garrett argues conversely that the fact that Spinoza thinks finite things strive to preserve themselves 'provides an obvious avenue for explaining the behavior of singular things by appeal to the self-preserving tendency of that behavior'.²⁸

²⁵ This is my understanding of the objection pressed upon me by Martin Schwab.

²⁶ Dennis Des Chene, *Physiologia: Natural Philosophy in Late Aristotelian and Cartesian Thought* (Ithaca, NY: Cornell University Press, 1996), 207.

²⁷ Larry Wright, *Teleological Explanations: An Etiological Analysis of Goals and Functions* (Berkeley, Calif.: University of California Press, 1976).

²⁸ Don Garrett, 'Teleology in Spinoza and Early Modern Rationalism', in Rocco J. Gennero and Charles Huenneman (eds.), *New Essays on the Rationalists* (Oxford: Oxford University Press, 1999), 313.

I agree that that avenue is open to Spinoza, but the key interpretive question is whether Spinoza goes down it. I see no evidence that he does. That is, I see no evidence that Spinoza argues that all (or perhaps even that any) self-preserving behavior has its etiology in the fact that it is self-preserving. So I am inclined to think, contrary to Garrett, that Spinoza and Descartes are in the same boat with respect to unthoughtful teleology.²⁹ Both think bodies do strive and both think that is not sufficient for final causation, but if Aquinas is correct they are wrong in that judgment.

Still another even stronger conception of final causation requires that the end in question either be a good or be viewed as a good. Indeed it has been argued recently that this condition is essential for all final causation.³⁰ And one might assert, as Carriero does, that Aquinas himself is committed to this strong conception of final causation. I would respond to this in two ways. First, I agree that according to Aquinas's full-bodied conception of final causation every agent does act for sake of some good. However, as I argued at the outset, he regards the principle that every agent acts for sake of some good as a different principle from the principle that every agent acts for an end, and he offers separate arguments for them. Second, Aquinas has a very broad conception of the good, so broad that fire begetting fire counts for him as an agent acting for a good. He is committed to the Aristotelian view that good and being are extensionally equivalent, that evil is only found in the privation of actuality. Thus Aquinas's conception of the good is so broad that a body's causing itself to continue moving or a body causing another body to change its state of motion would also count as acting for a good. And, since Descartes considers rest not to be the privation of motion but as a mode with as much reality as motion, even causing something to stop moving would satisfy Aquinas's criterion of an agent's acting for a good. It could therefore plausibly be argued that even leaving aside God's role in Descartes's system, his physics can still be counted as teleological on a conception of teleology according to which agents must act for a good.

My primary conclusion is that it is reasonable to read Aquinas as operating with a stripped-down conception of final causation when he argues that

²⁹ *Ibid.*, 326, 332.

³⁰ Mark Bedau, 'Where's the Good in Teleology', *Philosophy and Phenomenological Research*, 52 (1992), 781–806.

efficient causation presupposes final causation. Yet this stripped-down conception is still of philosophical interest. It is not empty to assert that all efficient causes are aimed at something.³¹

³¹ Versions of this paper were presented at: the University of California, Riverside agency workshop; University of California, Irvine; UCLA history workshop; the University of Toronto; and the New England Colloquium in Early Modern Philosophy held at Yale University. I have received many very helpful suggestions and objections. I would like to thank Bonnie Kent, John Carriero, Jeffrey McDonough, Hannah Ginsborg, Don Garrett, Michael Della Rocca, John Fischer, Neal Tognazzini, Samantha Matherne, Larry Wright, Ermanno Bencivenga, Martin Schwab, Nicholas Jolley, William Bristow, David Woodruff Smith, Sean Kelsey, Tyler Burge, Marleen Rozemond, Jennifer Whiting, Donald Ainslee, Elmar Kremer, Kenneth Winkler, Justin Brookes, James Kreines, Lisa Downing, Larry Jorgensen, and Robert M. Adams.