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The Second Way

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My title refers to the second of the arguments for the existence of God commonly called Aquinas's "Five Ways." The argument reads as follows:

> The second way is from the notion of efficient cause. We find among observable things an order of efficient causes. We do not find, nor is it possible, that something is an efficient cause of itself; for such a thing would be prior to itself, which is impossible. Now it is not possible to proceed to infinity in efficient causes. The reason is that in all ordered efficient causes, the first is the cause of the intermediate, and the intermediate is the cause of the last, whether the intermediates are many or only one. But remove the cause, and the effect is removed; therefore, if there is no first in efficient causes, neither will there be a last nor an intermediate. But if there is a procession to infinity in efficient causes, there will be no first efficient cause. And thus there will be no last effect and no intermediate causes, which is obviously false. Therefore it is necessary to posit some first efficient cause, which all call God. (ST I, 2, 3)[1]

1. Here and elsewhere ST = *Summa Theologiae,* Leonine text, as contained in *Sancti Thomae de Aquino: Summa Theologiae* (Roma: Editiones Paulinae, 1962): "Secunda via est ex ratione causae efficientis. Invenimus enim in istis sensibilibus esse ordinem causarum efficientium: nec tamen invenitur, nec est possibile, quod aliquid sit causa efficiens sui ipsius; quia sic esset prius seipso, quod est impossibile. Non autem est possibile quod in causis efficientibus procedatur in infinitum. Quia in omnibus causis efficientibus ordinatis, primum est causa medii, et medium est causa ultimi, sive media sint plura sive unum tantum: remota autem causa, removetur effectus: ergo, si non fuerit primum in causis efficientibus, non erit ultimum nec medium. Sed si procedatur in infinitum in causis efficientibus, non erit prima causa efficiens: et sic non erit nec effectus ultimus, nec causae efficientes mediae: quod patet esse falsum. Ergo est necesse ponere aliquam causam efficientem primam: quam omnes Deum nominant."

For translations I have relied on *St. Thomas Aquinas: Summa Theologica,* 3 vols., trans. Fathers of the English Dominican Province (New York: Benziger, 1947), and especially on Anton C. Pegis, *Basic Writings of Saint Thomas Aquinas* (New York: Random House, 1945), but I have not followed either faithfully.

THE CONCLUSION

The conclusion is that there exists "some first efficient cause" (*aliquam causam efficientem primam*). Now, anything that is a first efficient cause surely is an efficient cause that has no efficient cause. So the conclusion of the Second Way must at any rate imply

(1) Ex(EyxCy & ~EyyCx),

where C is the relation of efficient causation, that is, the relation x bears to y just in case x is an efficient cause of y.

It may be thought that we are to understand the conclusion to be a stronger proposition, namely,

(2) E_1x (EyxCy & ~EyyCx)

which requires that there be exactly one thing in the field of C to which nothing bears the relation C. That (2) is the conclusion may be thought to be implied by Aquinas's use of 'first' (*primam*) and, as well, by the relative clause 'which all call God' (*quam omnes Deum nominant*). Now, it is no doubt true that Aquinas was ready to affirm (2); nevertheless, I doubt that he took it to be demonstrated in the Second Way. Indeed, I think the project in ST I, 2, 3 is to demonstrate that there is *a* God. Not until ST I, 11, 3 does Aquinas address the question whether there is *one* God (*utrum Deus sit unus*); and there he relies for a positive answer mainly on the simplicity and perfection of the divine nature, which he considers himself to have demonstrated in the intervening articles.[2]

To understand ST I, 2, 3 in this way requires that there the word 'God' be understood as a general term; otherwise 'there is a (at least one) God' would be nonsense. But this is hardly an impediment. As Peter Geach has more than once pointed out,[3] Aquinas himself said that the word *Deus* is a *nomen naturae:* "this name 'God' is an appellative name, not a proper name, because it signifies the divine nature as in a possessor" (ST I, 13, 9, ad 2).[4] In Aquinas's usage, then, the word 'God' admits a plural. And indeed we

2. Medieval philosophers standardly separate the questions of whether there is a God and whether there is one God. Henry of Ghent is explicit on the point: "Whether there be one or several such is not the issue here in the question about the being of God, but is a point that remains to be proved later in the question, namely, about his unicity." *Summa Quaestionem Ordinarium* 22, 4; as translated in John F. Wippel and Allan B. Wolter, *Medieval Philosophy* (New York: Free Press, 1969), p. 382. Compare Duns Scotus, *De Primo Principio,* III.

3. See Peter Geach, *God and the Soul* (New York: Schocken Books, 1969), p. 57, and G. E. M. Anscombe and P. T. Geach, *Three Philosophers* (Ithaca: Cornell University, Press, 1961), p. 109.

4. "Hoc nomen *Deus* est nomen appellativum, et non proprium, quia significat naturam divinam ut in habente." See also ST III, 35, 4, ad 3.

find him concluding at ST I, 11, 3 that "it is impossible that there be many Gods" (*impossibile est ergo esse plures Deos*). Out of piety, I suppose, the author of a certain Latin grammar cautions students to "decline *Deus* only in the singular." Aquinas would have thought the piety misplaced.

As for the word 'first', notice that it is qualified by 'some' (*aliquam*); and 'some first cause' must surely be interpreted in the sense of 'a cause to which nothing is causally prior'.

According to Aquinas, God is an efficient cause of all things (other than Himself, of course).[5] An alternative strengthening of (1) may therefore be suggested, namely;

$$(3)\ Ex(EyxCy \ \&\ {\sim}EyyCx \ \&\ (z)\ ({\sim}z = x \rightarrow xCz)).$$

Again, I do not deny that we have here a proposition Aquinas would have affirmed. But I think it is not the conclusion of the Second Way. For one thing, no hint of it occurs in the text of the Second Way itself. For another, not until I, 44, 1 does Aquinas attempt to show that " anything which in any way exists is from God" (*omne quod quocumque modo est, a Deo esse*); and though the argument is not easy to understand, it explicitly appeals to the doctrine that God is per se subsistent being itself (*ipsum esse per se subsistens*), which is allegedly demonstrated at I, 3, 4, and thus after the statement of the Second Way.

Propositions (2) and (3) are, of course, interesting in themselves, but a proper consideration of them would go well beyond the limits of this article. My present point is simply that neither proposition is the conclusion of the Second Way.

THE PREMISES

Aquinas takes his conclusion to follow from three propositions: first, that in observable things there is an order of efficient causes (*in istis sensibilibus esse ordinem causarum efficientium*); second, that it is not possible for something to be an efficient cause of itself (*nec tamen invenitur, nec est possibile, quod aliquid sit causa efficiens sui ipsius*); third, that it is not possible to proceed to infinity in efficient causes (*non autem est possibile quod in causis efficientibus procedatur in infinitum*). Subsidiary arguments are given for the second and

5. Thus he says at I, 44, 4, *ad* 4, "Deus sit causa efficiens . . . omnium rerum." Translators—for instance, the English Dominicans and Pegis—use the definite article where I have the indefinite. If their definite article is to be understood strictly, then the question is how best to understand Aquinas. It becomes clear that he could not have intended here to deny that, for example, Abraham was an efficient cause of Isaac.

third propositions; but as far as the Second Way is concerned, they do no work unless the conclusion follows from the three propositions just mentioned.

The second proposition is clear enough. Without its modality, it says that C is irreflexive:

(4) (x) ~ xCx.

But what of the first and third? Classroom expositions often take the third to be, in contemporary jargon,

(5) There is no infinitely descending C-sequence,

that is, no sequence

$\ldots x_2, x_1, x_0$

such that x_i bears C to x_{i-1} for each positive integer i. As for the first, these same expositions take it to say no more than that C is nonempty:

(6) ExEyxCy.

Aquinas's reference, in the formulation of the first proposition and in the subsidiary argument for the third, to an *order* of efficient causes may raise a doubt about the accuracy of the classroom interpretation; and we shall see later that such a doubt is indeed justified. But in the meantime we may note that the resulting argument has at any rate one virtue: the conclusion of the Second Way—that is, (1)—follows from the three propositions (4), (5), and (6); in fact, it follows simply from (5) and (6). Let us see why.

VALIDITY OF THE ARGUMENT

A consequence of the axiom of choice (in the presence of other standard set-theoretic axioms) is the *principle of dependent choices:* If R is a nonempty relation[6] and the range of R is included in the domain of R, then there exists an infinitely ascending R-sequence—that is, a sequence

$x_0, x_1, x_2, \ldots$

such that, for every natural number n, x_n bears R to x_{n+1}. Assume the axiom of choice in this form: every relation includes a function with the same domain.[7] The principle of dependent choices is then demonstrable, as follows. Let R be a nonempty relation of which the range is included in the domain. By the axiom of choice, there is a function g included in R such that the domain of g is the domain of R. Where x is any member of the domain of R, there then exists by finite recursion a function f such that the domain of f is the set of natural numbers, f(0) is x and f(n + 1) is g(f(n)) for every n. Since g is included in R, f(n) bears R to f(n + 1) for every n. Hence, f is an infinitely ascending R-sequence, as required.[8]

The purpose of this little deduction is not to persuade anyone of the truth of the principle of dependent choices. If persuasion is wanted, one may better argue informally as follows. Again, let R be a nonempty relation of which the range is included in the domain. Nonemptiness of R means that something x bears R to something y. But then inclusion of the range of R in the domain of R guarantees that y in turn bears R to something z, which in its turn bears R to something w, and so on without end. If it is pointed out that nothing in the situation requires that y, z, w, and so on be other than x, one may simply agree; for, an infinitely ascending R-sequence, as required by the principle of dependent choices, need not be nonrepetitive.

Some easy manipulations show that the principle of dependent choices can as well be put this way: if R is nonempty and the domain of R is included in the range of R, then there is an infinitely descending R-sequence. Equivalently, if R is nonempty and there is no infinitely descending R-sequence, then the domain of R is not included in the range of R. Or, spelling out what is meant by nonemptiness of R and noninclusion of its domain in its range,

(7) For every relation R, if ExEyxRy and there is no infinitely descending R-sequence, then Ex(EyxRy & ~EyyRx).

6. I take relations always to be dyadic. I treat them as sets of ordered pairs, but such outright identification is not essential to the discussion that follows.

7. A more familiar version is this: for every set X of nonempty sets, there is a function f such that, for every A in X, f(A) is in A. Here f is called a *choice function* for X. In particular, then, if R is a nonempty relation, there is a choice function g for the set of sets of the form {z:xRz}. But then the set of ordered pairs <x,y> such that x belongs to the domain of R and y = g ({z:xRz}) is a function included in R having the same domain as R. Thus the more familiar version implies that the one in the text holds for nonempty relations; the case of the empty relation is trivial. For the reverse implication, let X be a set of nonempty sets, and let E be the set of ordered pairs <A,x> such that A is in X and x is in A. Then E includes a function with the same domain, a function that is evidently a choice function for X.

8. The principle of dependent choices appears to have been first isolated by Paul Bernays. See "A System of Axiomatic Set Theory," *Journal of Symbolic Logic* 7 (1942): 65–89, at 86. It is known to be weaker than the axiom choice: see A. Mostowski, "On the Principle of Dependent Choices," *Fundamenta Mathematicae* 35 (1948): 127–30.

Here we have the principle of dependent choices in a form immediately relevant to the Second Way, for instantiation of (7) to the particular case of C yields

> (8) If ExEyxCy and there is no infinitely descending C-sequence then Ex(EyxCy & ~EyyCx),

which is the conditional having the conjunction of (5) and (6) as antecedent and (1) as consequent. If, as I think, (7) is a necessary truth, so is (8); and if (8) is a necessary truth, (5) and (6) together strictly imply (1). Plain truth of (7) permits us to say that the conjunction of (5) with (6) set theoretically implies (1).

A SECOND SECOND WAY

By putting the principle of dependent choices to further work, we may formulate an alternative version of the Second Way.

First, a couple of definitions. Where R is any relation and A any set, an *R-minimal* member of A is a member of A to which nothing in A bears R; and R is *well founded* if and only if every nonempty set has an R-minimal member. Using the principle of dependent choices we may then show

> (9) A relation R is well founded if and only if there is no infinitely descending R-sequence.

Proof: It is obvious that a well-founded relation admits of no infinitely descending sequence: the terms in any such sequence would constitute a set that had no member minimal with respect to the relation. For the other direction, assume that R is not well founded, so that some nonempty set A has no R-minimal member. Let S be the restriction of R to A, that is, the relation that x bears to y just in case x and y are members of A and x bears R to y. Since A has no R-minimal member and S is included in R, the domain of S is included in the range of S. So, by the principle of dependent choices, there is an infinitely descending S-sequence. But any such is also an infinitely descending R-sequence.

The upshot is that we obtain an equivalent of the classroom version of the Second Way by replacing (5) with

> (10) C is well founded.

The Second Way, thus understood, is simply this: since efficient causation is nonempty and well founded, something is an efficient cause that has no efficient cause.

IRREFLEXIVITY AND TRANSITIVITY

We have seen that Aquinas seems to make the conclusion of the Second Way depend on irreflexivity of the relation of efficient causation. Commentators typically follow him on this point, and sometimes they take transitivity of the relation to be an additional premise. Thus Anthony Kenny claims to detect in each of the Five Ways a common formal structure: a nonempty relation R is shown to be irreflexive and transitive, and from this it is concluded that either the domain of R is not included in its range or there is an infinitely descending R-sequence.[9] Now, of course, it is true that if R is nonempty, irreflexive, and transitive, then either the domain of R is not included in its range or there is an infinitely descending R-sequence. That is an immediate consequence of the principle of dependent choices. But I am nevertheless dissatisfied with Kenny's description of the common formal structure, at least in the case of the Second Way.

As for irreflexivity of C, it is enough to note that it adds nothing to the deductive power of (5), or (10), and (6). The reason is that (4) is already a consequence of (5): if x were to bear C to x, then {x} would have no R-minimal member and hence C would not be well founded. More generally, (5) bans C-cycles, that is, sequences

$$x_0, x_1, \ldots, x_n$$

such that

$$x_n R x_0 R x_1 R \ldots R x_{n-1} R x_n.$$

Again, the terms of such a sequence would constitute a set having no R-minimal member.

For three reasons I have not assumed C to be transitive. One is that the assumption is unnecessary: (1) follows without it. Another is that nothing Aquinas says in the statement of the Second Way implies that efficient causation is transitive. The third, and most important, is that Aquinas took efficient causation to be *non*transitive. *Begetting* is included in efficient causation.[10] But though Abraham begot Isaac and Isaac begot Jacob, Abraham did not beget Jacob.

9. Anthony Kenny, *The Five Ways: St. Thomas Aquinas' Proofs of God's Existence* (New York: Schocken Books, 1969), pp. 36–37. My description of the structure differs from Kenny's in matters of detail that seem to me not to affect the points at issue. In particular, I speak of an infinitely descending R-sequence, whereas Kenny instead speaks of "an endless series of things standing in the relation R to each other." His phrase admits of more than one interpretation; I have interpreted it weakly.

10. See, for example, ST I, 46, 2, ad 7.

PROBLEMS

When they first encounter the Second Way, students invariably question (5), the proposition that there is no infinitely descending C-sequence. They do not find the proposition obvious, and they find the argument Aquinas gives for it question begging. Aquinas argued;

> Now in efficient causes it is not possible to proceed to infinity, because in all ordered efficient causes, the first is the cause of the intermediate, and the intermediate is the cause of the ultimate cause, whether the intermediates are many or only one. Now, remove the cause and the effect is removed. Therefore, if there is no first cause among efficient causes, there will be no ultimate, nor any intermediate, cause. But if in efficient causes it is possible to proceed to infinity, there will be no first efficient cause, and thus neither will there be an ultimate effect, nor any intermediate efficient causes—which is plainly false.[11]

It is indeed hard to overcome an impression that the question has been begged.

Scholars may find it more troubling, however, that in other places Aquinas explicitly states that infinitely descending C-sequences *are* possible. Divine revelation alone assures us that in actuality there are none. But then what is to be made of the argument just quoted, the conclusion of which seems to be that infinitely descending C-sequences are *not* possible? And of what use is an argument for the existence of God that rests on an article of faith?

A text central to all this occurs in ST I, 46, 2. The question there under discussion is whether it is a matter of faith that the world began. Aquinas holds that it is. But he must answer objections, of which the seventh is a purported demonstration that the world began:

> If the world was eternal, generation was from eternity. Therefore one man was begotten of another to infinity. But the father is an efficient cause of the son, as is said in *Physics* II. Therefore in efficient causes there is an infinite series—which is disproved in *Metaphysics* II.[12]

11. "Non autem est possibile quod in causis efficientibus procedatur in infinitum. Quia in omnibus causis efficientibus ordinatis, primum est causa medii, et medium est causa ultimi, sive media sint plura sive unum tantum: remota autem causa, removetur effectus: ergo, si non fuerit primum in causis efficientibus, non erit ultimum nec medium. Sed si procedatur in infinitum in causis efficientibus, non erit prima causa efficiens: et sic non erit nec effectus ultimus, nec causae efficientes mediae: quod patet esse falsum."

12. "Si mundus fuit aeternus, et generatio fuit ab aeterno. Ergo unus homo genitus est ab alio in infinitum. Sed pater est causa efficiens filii, ut dicitur in II *Phys.* Ergo in causis efficientibus est procedere in infinitum: quod improbatur in II *Metaphys.*"

Thus stated, the objection is silly: eternity of the world would hardly require an endless generation of human beings.[13] But Aquinas in effect responds to a stronger version, which can be put this way:

> If it is possible that the world did not begin, then it is possible that there should have been an infinitely descending C-sequence. But, as is shown in *Metaphysics* II, infinitely descending C-sequences are not possible. Therefore, it is not possible that the world did not begin.

Aquinas answers at some length:

> In efficient causes it is impossible to proceed to infinity *per se*—if, for instance, the causes *per se* required for some effect were multiplied to infinity; for instance, if a stone is moved by a stick, the stick by the hand, and so on to infinity. But it is not impossible to proceed to infinity *per accidens* in efficient causes; for instance, if all the causes multiplied to infinity have the order of only one cause, but their multiplication is *per accidens:* for example, as a craftsman acts by means of many hammers *per accidens,* because one after another is broken. It is accidental, therefore, that one particular hammer should act after the action of another. And it is likewise accidental to this man as generator that he is generated by another; for he generates as a man, and not as son of another man. For all men generating hold one grade in the order of efficient causes, namely the grade of a particular generator. Hence it is not impossible that man is generated by man to infinity; but such a thing would be impossible if the generation of this man depended upon this man, and on an elementary body, and on the sun, and so on to infinity.[14]

13. As Aquinas points out in *De Aeternitate Mundi,* where he remarks that "God could have made the world without men and souls; or He could have made men at the time He did make them, even though He had made all the rest of the world from eternity"; as translated in Cyril Vollert et al., *On the Eternity of the World* (Milwaukee, Wisc.: Marquette University Press, 1964), p. 25.

14. See also ST I–II, 1, 4.

In causis efficientibus impossibile est procedere in infinitum per se; ut puta si causae quae per se requiruntur ad aliquem effectum, multiplicarentur in infinitum; sicut si lapis moveretur a baculo, et baculus a manu, et hoc in infinitum. Sed per accidens in infinitum procedere in causis agentibus non reputatur impossibile; ut puta si omnes causae quae in infinitum multiplicantur, non teneant ordinem nisi unius causae, sed earum multiplicatio sit per accidens; sicut artifex agit multis martellis per accidens, quia unus post unum frangitur. Accidit ergo huic martello, quod agat post actionem alterius martelli. Et similiter accidit huic homini, inquantum generat, quod sit generatus ab alio: generat enim inquantum homo, et non inquantum est filius alterius hominis; omnes enim homines generantes habent gradum in causis efficientibus, scilicet gradum particularis generantis. Esset autem impossibile, si generatio huius hominis dependeret ab hoc homine, et a corpore elementari, et a sole, et sic in infinitum. See also ST I–II, 1, 4.

The passage is not in every way transparent, so let me say what I can by way of explanation.

The point of the illustration concerning the craftsman who uses infinitely many hammers is not altogether clear. Let us imagine, with Geach, that the craftsman is in particular "an immortal blacksmith who has been making horseshoes from all eternity, and has naturally worn out no end of hammers in the process"; and let us agree that "the making of the horseshoe now on the anvil depends only upon the smith as efficient cause and the hammer currently in use as instrument," so that "though no end of hammers have in fact been broken in the past, they have nothing to do with the [present] case."[15] The difficulty is that we do not have an imagined case of an infinitely descending C-sequence. I think Aquinas would have said that each hammer is a cause, though one that acts through the action of the smith.[16] And the hammers do make up an imagined, infinitely descending temporal sequence. But such descending C-sequences as can be extracted from the illustration are finite: none of the hammers bears C to any other, and no horseshoe is described as the start of an infinitely descending C-sequence.

Maybe the illustration is to be understood somewhat differently: an immortal smith again, but this time one who has been at work on a single horseshoe from eternity and who has, in an extraordinary run of bad luck, broken no end of hammers in the process. Here we imagine not only that there have been infinitely many hammers used but also that the horseshoe presently on the anvil has an infinite causal ancestry. Still no infinitely descending C-sequence, however, for, again, none of the hammers can be regarded as bearing C to any other.

Maybe, then, Aquinas has given us an overly succinct description of an illustration that Averroes used and that may have been in the air. To explain the kind of case in which "according to philosophical doctrine" an infinite regress of efficient causes is possible, Averroes said that

> when an artisan produces successively a series of products of craftsmanship with different instruments, and produces these instruments through instruments and the latter again through other instruments, the becoming of these instruments one from another is something accidental, and none of these instruments is a condition for the existence of the product of craftsmanship except the first instrument which is in immediate contact with the work produced . . . . And the instrument with which this instrument is produced will be necessary for the production of this instrument, but will not be necessary for the production of the product of craftsmanship unless accidentally.[17]

15. Anscombe and Geach, *Three Philosophers,* p. 112.

16. See ST I, 36, 3.

17. *Tahafut al-Tahafut,* 4th discussion, as translated by Simon van den Bergh, *Averroes' Tahafut al-Tahafut* (London: Luzac, 1954), vol. 1, p. 159. I say the illustration "may have been in the air" to avoid giving the impression that Aquinas might have read *Tahafut al-Tahafut.* Apparently that work was not translated into Latin until the fourteenth century.

Simplifying somewhat, we may this time imagine the immortal smith producing the present horseshoe with a hammer he has produced with another hammer, which latter hammer he has produced with still another, and so on endlessly. And with that we do get an imaginary case of an infinitely descending C-sequence.

Whatever in the end is to be made of Aquinas's first illustration, his second appears to leave no doubt that he thought it possible for there to be infinitely descending C-sequences: it is not impossible for man to be generated from man to infinity. But such a sequence would be ordered *per accidens,* not *per se.* And we are expressly told that it *is* impossible for there to be an infinitely descending C-sequence that is per se ordered. What is the intended distinction? And how does it bear on the Second Way?

THE DISTINCTION

Aquinas is less explicit about the nature of the intended distinction than one might have hoped. But certain of his remarks, together with some things that Duns Scotus says, make it reasonably clear that a per se ordered descending C-sequence is supposed to satisfy three conditions. First, the restriction of C to the terms of the sequence is transitive, so that any term of the sequence bears C to such terms as may follow it in the sequence. I take it that this lies behind Aquinas's remark that "when we have many ordered causes, it is necessary that, while the effect depends first and principally on the first cause, it also depends in a secondary way on all the intermediate causes" (ST I, 104, 2).[18] And it is presumably what Scotus meant when he said that "if anything is prior to the prior, it is prior to the posterior."[19] Second, the causal action of any term in the sequence is simultaneous with that of any other term in the sequence, so that there is some one time at which all the terms of the sequence exist. As Scotus says, "All the causes *per se* ordered are necessarily required simultaneously for that which is caused."[20] Third, any "intermediate"—that is, any term y of the sequence for which there are terms x and z in the sequence such that xCy and yCz—exercises its causality by virtue of being caused by its immediate predecessor in the sequence. This last condition is hard to state clearly, but perhaps the idea is sufficiently conveyed by Aquinas's example: the hand moves the stick and *thereby* the stick moves the stone. Aquinas puts the point elsewhere by saying that "if there are many agents in order, the second agent [i.e., any intermediate] always acts in virtue of the first; for the first

18. "Cum enim sunt multae causae ordinatae, necesse est quod effectus dependeat primo quidem et principaliter a causa prima; secundario vero ab omnibus causis mediis." See also *In octo libros Physicorum expositio,* VIII, 9 (1047).

19. *De Primo Principio,* II, argument for the second conclusion.

20. *De Primo Principio,* III, argument to the second conclusion.

agent moves the second to act" (ST I, 105, 5).[21] And Scotus says that "in *per se* [ordered causes], the second, in so far as it causes, depends on the first."[22]

Though hard to state, the third condition is evidently to be regarded as fundamental. Scotus says that transitivity follows from it, and Aquinas reports Aristotle, apparently with approval, to the same effect:

> Let A be something which is moved in respect to place by something B. And B is moved by C; C is moved by D . . . . It is clear that when a thing moves because it is moved, the mover and the mobile object are moved simultaneously. For example, if the hand by its own motion moves a staff, the hand and the staff are moved simultaneously. Hence B is moved simultaneously when A is moved; and for the same reason when B is moved, C is moved simultaneously; and when C is moved, D is moved simultaneously. Therefore the motions of A and of all the others are simultaneous and in the same time.[23]

I conjecture that neither Aquinas nor Scotus ever played with dominoes. The finger by moving moves the first domino, which by moving moves the second, and so on down the line; but even with a not very long line, the motion of the finger visibly stops before the last domino falls.

It is clear in any case that a descending C-sequence in which x_n begets x_{n-1} satisfies none of these conditions, in particular, not the third: it is not by virtue of Abraham's act of begetting that Isaac begets Jacob.

A THIRD SECOND WAY?

Aquinas's subsidiary argument for the impossibility of an infinitely descending sequence of efficient causes must thus be understood as directed only to those cases in which the sequence is per se ordered. A number of commentators on the Second Way have pointed this out.[24] Some appear to

21. "Si sint multa agentia ordinata, semper secundum agens agit in virtute primi: nam primum agens movet secundum ad agendum."

22. *De Primo Principio,* III, argument to the second conclusion. In the same place Scotus states a fourth condition, namely, that "in *per se* ordered [causes] the causality is of another nature and order, because the higher is more perfect."

23. *In octo libros Physicorum,* VII, 2 (892); as translated by Richard J. Blackwell, Richard J. Spath, and W. Edmund Thirlkel, *Commentary on Aristotle's Physics by St. Thomas Aquinas* (New Haven, Conn.: Yale University Press, 1963), p. 426.

24. See, for example, Patterson Brown, "Infinite Causal Regression," *Philosophical Review* 75 (1966): 510–25; reprinted in Anthony Kenny, *Aquinas: A Collection of Critical Essays* (Garden City; New York: Doubleday, 1969) pp. 214–36; Reginald Garrigou-Lagrange, *Reality: A Synthesis of Thomistic Thought* (St. Louis and London: Herder, 1950), pp. 73–74; Etienne Gilson, *The Christian Philosophy of St. Thomas Aquinas,* (New York: Random House, 1966), pp. 67–68; Kenny, *The Five Ways,* pp. 41–42; Richard Sorabji, *Time, Creation and the Continuum* (Ithaca, N.Y.: Cornell University Press, 1983), pp. 230–31; Michael Dummett, *The Seas of Language* (Oxford: Clarendon Press, 1993), pp. 366–67.

think that recognition of the distinction somehow removes any problems the Second Way may have seemed to present.[25] Others are less complacent, speculating as to the reasons Aquinas and others may have had for denying the possibility of infinite descent in the per se case.[26] Some conclude that there are no *good* reasons.[27]

Little attention has been given, however, to the job of reconstructing the Second Way in the light of the distinction between per se and per accidens ordered descending C-sequences. Once the possibility of infinitely descending C-sequences is acknowledged, how is the argument supposed to go? It will not do simply to replace (5) with

(11) There is no infinitely descending per se ordered descending C-sequence.

For then (1) no longer follows: after all, (11) is compatible with there being no per se ordered descending C-sequences. If in addition (6) is replaced by

(12) There is some per se ordered descending C-sequence,

it will follow that in some per se ordered descending C-sequence there is a term preceded by nothing in the sequence. But that follows from (12) alone; in any case, (1) still doesn't follow.

If we are to preserve the *structure* of the classroom version of the Second Way, and I think we ought to try, what is wanted is a (nonempty) *species* of efficient causation—that is, a relation B such that

(13) ExEyxBy

and

(14) (x) (y) (xBy $\rightarrow$ xCy),

which relation is also such that

(15) Every descending B-sequence is per se ordered

and

(16) (x) [(EyxBy & ~EyyBx) $\rightarrow$ ~EyyCx].

From (11) and (15) there will follow

(17) There is no infinitely descending B-sequence.

And from (13) and (17), for reasons now familiar, there will follow

(18) Ex (EyxBy & ~EyyBx);

25. For example, Gilson, *Christian Philosophy.*
26. See Brown, "Infinite Causal Regression," and Kenny, *The Five Ways.*
27. See Sorabji, *Time, Creation and the Continuum.*

that is, there exists a B-first. And then by (16) there will exist a C-first. But what can serve as B?

Aquinas follows Aristotle in distinguishing two kinds of efficient causation. Of one kind are cases in which something changes something: the physician heals the patient; the batter swings the bat; the fire heats the water. Of another kind are cases of generation, in which something causes something to come to be. Among cases of this kind are acts of divine creation and of natural generation, such as begetting and building.[28] It is commonly held that in the Second Way, Aquinas has his eye especially on the second kind of case, the other having been central in the First Way. Thus Geach says, "The first two 'ways' differ only in that one relates to processes of change and the other to things' coming to be; the further argument is quite parallel in each case."[29] I am inclined to think, however, that the efficient causation of the Second Way is neither of these but rather what Aquinas elsewhere calls *conservation*.[30]

At ST I, 104, 1, Aquinas addresses the question of whether creatures need to be kept in being by God (*utrum creaturae indigeant ut a Deo conserventur*). Of course, he thinks they do, and in fact he had already said so at ST I, 9, 2. What is of interest for present purposes, however, is that here, in the course of explaining his answer, he draws a distinction between two sorts of causal agency. It must be recognized, he says, that "an agent may be the cause of the becoming of its effect and yet not of its being" (*aliquod agens est causa sui effectus secundum fieri, et non directe secundum esse eius*). The builder causes the house to come into being, and the begetter causes the begotten to come into being, but neither the builder nor the begetter causes the being of that which is thus caused to become. Dark words, no doubt; yet the idea seems not altogether inaccessible.

Aquinas would distinguish between two questions: (1) what causal agent is responsible for the coming into existence of the house or the child? (2) What causal agent is responsible for the continued existence of the house or child? Evidently an answer to the first need not be an answer to the second: the builder's work typically ends with the completion of the house, and the begetter preserves the begotten, if at all, only, as Aquinas says, "indirectly," that is, by removing causes of "corruption"—say by guarding the child from falling into the fire (*puta si aliquis puerum custodiat ne cadat in ignem*). Aquinas puts the distinction by saying that a cause of becoming is the reason "that this matter acquires this form" (*quod haec materia acquirat hanc formam*), whereas a cause of being is a "cause of the form as such" (*causa formae secundum rationem talis formae*). It is simpler and

28. For the distinction between the two kinds of efficient causation, and also for other distinctions within that genus of causation, see Aquinas's *In duodecim libros Metaphysicorum expositio,* V, l. 2.

29. Anscombe and Geach, *Three Philosophers,* p. 113. See also Gilson, *Christian Philosophy,* p. 66, and Kenny, *The Five Ways,* p. 36.

30. Suggested also, if I understand him correctly, by Reginald Garrigou-Lagrange in *Reality,* pp. 72–75.

perhaps clearer to say, with Ockham, that what *produces* need not be that which *conserves*.[31]

I do not mean to suggest that we are now out of the woods. On the contrary, the conclusion of the Second Way is now to be seen as resting on five premises: (11), (13), (14), (15), and (16), with B understood to be the relation of conservation; and I suppose any one of these propositions might be questioned.

My inclination is to concede (14) and (15), if only because I hardly know what to say for or against them.[32] As for (13) and (16), I suspect that Aquinas would take them to rest on what he would regard as more fundamental truths, namely,

(19) x is contingent $\rightarrow$ EyyBx

and

(20) ~x is contingent $\rightarrow$ ~EyyCx.

Contingent things are those that need not exist; they teeter on the brink of nonexistence.[33] Aquinas, along with other philosophers, earlier and later, thought it obvious that anything so situated needs something to prevent its fall.[34] Thus (19) and, given that something *is* contingent, (13). As for (20),

31. See *Quaestiones in lib. I Physicorum,* cxxxvi; translated by P. Boehner, in *Ockham, Philosophical Writings* (Indianapolis: Bobbs-Merrill, 1964), pp. 136–39. Descartes follows Aquinas closely, in both terminology and examples, saying that "an architect is the cause of a house and a father of his child only in the sense of being the causes of their coming into being; and hence, once the work is completed it can remain in existence quite apart from the 'cause' in this sense. But the sun is the cause of the light which it emits, and God is the cause of created things, not just in the sense that they are causes of the *coming* into being of these things, but also in the sense that they are causes of their *being.*" *Reply to the Fifth Set of Objections,* as translated in John Cottingham, Robert Stoothoff, and Dugald Murdoch, *The Philosophical Writings of Descartes,* vol. II, pp. 254–55 (hereafter referred to as CSM). (Cambridge: Cambridge University Press, 1985).

32. It may be noted that Descartes does not hesitate to count conservation as a species of efficient causation. See CSM, pp. 78–79.

33. Geach says that "this understanding of . . . 'contingent' is quite alien to [Aquinas's] thought; for him contingent beings are liable to corrupt, break up, or the like, and necessary beings are beings with no such inner seeds of their own destruction; souls and angels belong to the latter class, and so, he thought, do the heavenly bodies, which, being supposedly incorruptible, are expressly called *entia ex necessitate.*" *God and the Soul,* p. 77. Geach is right about Aquinas's use of 'contingent,' but the notion of contingency alluded to in the text is by no means "alien to Aquinas's thought."

34. Avicenna wrote, "Perhaps someone is of the opinion that the agent and the cause are only required in order that something has existence after it did not exist and that, once the thing exists and the cause is missing, the thing exists as self-sufficient. And he who is of this opinion thinks that something only needs a cause for

well, I suppose we can agree that what could not fail to exist needs neither a producer nor a conserver.

But what about (11)? We saw some time back that in a per se ordered descending C-sequence, the causal action of any term in the sequence is simultaneous with that of any other term in the sequence and that there must therefore be some one time at which all the terms of the sequence exist. Aquinas would think this is enough to show that per se ordered infinitely descending C-sequences are not possible, for he thought it impossible for there to be an infinite multitude of actually existing things.[35] But I doubt that it was his only reason, or even his most fundamental. Avicenna and Algazali had argued against the possibility of a per se ordered infinitely descending C-sequence on the ground that in such a sequence the ultimate effect would depend on an actual infinity of causes and hence could never obtain. It is infinite *dependency* that in their view makes for the impossibility. I think Aquinas agrees. In *Summa contra gentiles* (II, 38), in response to a purported proof of the noneternity of the world, he says that

> according to the philosophers, it is impossible to proceed to infinity in the order of efficient causes which act together at the same time, because in that case the effect would have to depend on an infinite number of actions simultaneously existing. And such causes are essentially infinite, because an infinity of them is required for the effect.[36]

I think Aquinas speaks here for himself, not only for "the philosophers." And so I take him to be saying that infinite dependency, as would be exemplified in an infinitely descending per se ordered C-sequence, is impossible. But why? Sometimes I see it, or think I do; but then again I don't.

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its coming into being and that, once it has come into being and exists, it can do without the cause. According to this opinion, causes are causes for coming into being only, and they exist prior to the thing, not simultaneously with it. But he who holds this opinion thinks something absurd." *Metaphysics*, 6th treatise, as translated in Arthur Hyman and James J. Walsh, *Philosophy in the Middle Ages* (Indianapolis: Hackett, 1973), p. 249. And in response to Gassendi, Descartes wrote, "You say that we have a power which is sufficient to ensure that we shall continue to exist unless some destructive cause intervenes. But here you do not realize that you are attributing to a created thing the perfection of a creator, if the created thing is able to continue in existence independently of anything else." CSM, p. 255.

35. See ST I, 7, 4.

36. "Causas agentes in infinitum procedere est impossibile, secundum philosophos, in causis simul agentibus: quia oporteret effectum dependere ex actionibus infinitis simul existentibus. Et huiusmodi sunt causae per se infinitae: quia earum infinitas ad causatum requiritur."