

things only: (i) Sustaining causation would be *concurrent* causation – E would be sustained at a time by ‘activity’ of C at this time; and (ii) sustaining causation would be *per se* causation – if first cause F sustains intermediate cause I, which sustains Ultimate Effect U, then the ‘activity’ by which F sustains U ‘comes from’ the ‘activity’ by which F sustains I, somewhat as, when a hand moves a stick that moves a stone, the shove that the stick inflicts on the stone comes from the shove that the hand exerts on it, the stick.

4. THE INFINITE AND INFINITE REGRESSES

4.1 Premise (7)

“[I]n efficient causes it is not possible to go to infinity”
(ST I q2,a3 p. 22)

This premise, taken as it is natural to do to be about generating causes, is in the spirit of one interpretation of the words that head the present chapter: “It is not conceivable that successions of causes and effects leading to now should have sprung from nowhere,” that is, that they should have not ever have been begun. But *is* this inconceivable? Is it *inconceivable* that there should be causes of causes of causes, without a beginning or first cause, each cause bringing into being its successor? Let me put the question differently. Did you understand that question?! If so, you may well have ‘conceived’ the very thing whose conceivability is at issue! Which is to say you may have an idea of it, a consistent idea that harbors no contradictions. Such ideas seem *easy* to come by. Here is an explanation for the idea of *infinitely many* past generations of *chickens*. Let the present generation be the (0)-generation, the just previous generation be the (–1)-generation, the generation previous to it be the (–2)-generation, *and so on for every negative integer (–n)*. We now have the idea of infinitely many generations of chickens; there is the current one for 0, and there is one for every negative integer of which there are of course infinitely many. So we have an idea of an *infinite regress* of generations of chickens. And since the chickens (perhaps in pairs) of each generation are efficient causes of the chickens of the next generation, we have the idea of *infinite regresses* of efficient causes! Though we do not *believe* in that regress, there is no question but that we have an *idea* of it. “Ah, but is it a *consistent* idea that harbors no *a priori* contradictions?” There *is* this question, but unless and until it is backed up with reasons for doubting the consistency of this idea, it is *only* a question, for the idea detailed certainly *seems* consistent, and, to *adapt* ‘Leibniz’s license,’ we have the right to presume the consistency of every *prima facie* consistent idea until someone proves the contrary by deriving *a priori* a contradiction from it. That is *not* ‘Leibniz’s license’ itself, which would be not only for the consistencies of ideas of things, but for the *possibilities* of things of which we have consistent ideas. He did not separate the

conditions of conceptual consistency and logical possibility as the conceptual consistency of *magicans* requires, given that there are no magicians (Section 8.1 of chapter III).

4.2. There are *prima facie* counterexamples to Aquinas's anti-infinite regress premise. It seems possible that there should have been infinitely many past generations of chickens, and not only of chickens. But tilting against apparent counterexamples are *arguments* for that premise. These want to be examined. Also, even if there are counterexamples, to that premise there can be something in it. There can be *kinds* of infinite regresses of causes that are *not* conceivable and that are indeed impossible. I think there are. Before getting on with these matters, there is to be considered briefly a popular argument against infinite regresses of generating-causes that Aquinas knows how to deflate. It goes like this: "If there have always been chickens who have reached productive maturity in not less than a year, then an infinite number of generations of chickens, each responsible for the one after it, preceded the present one, and chickens have lived in an infinite number of years preceding the present year. But it is impossible to traverse what is infinite. Therefore there would never have arrived these present chickens. Which is manifestly false!" This objection to infinitely many generations of chickens is modeled on an objection to the possibility that the world has always been that Aquinas takes up (ST I q46,a2 p. 452).⁹ His reply when elaborated is sufficient to that objection and the present one. He writes: "Passage is always understood as being from term to term. Whatever by-gone day we choose, from it to the present day there is a finite number of days which can be traversed" (ST I q46,a2 p. 455). Aquinas suggests that, for openers, the question, "If there have been infinitely many previous days, how did the world get to this day?" should be met with the question, "Get to this day *from when?*" When this question is answered and the initial question *completed* as required by the fact that 'passage is always understood as from term to term,' the answer to the initial question, however exactly it is completed, can be, in the manner of sportscaster-speech, "One day at a-time." I leave to the reader further elaboration of Aquinas's reply to that popular consideration against infinite temporal regresses of causes.¹⁰

4.3. *Aquinas's argument for the impossibility of an infinity of efficient causes of efficient causes.* Aquinas does not believe that it is *necessary* that the world began some finite time ago. "That the world did not always exist we hold by faith alone: it cannot be proved demonstratively" (ST q46,a2 p. 453). Perhaps it was partly for this reason that he felt the need to demonstrate that infinite regresses of efficient causes are impossible. In any case, he does offer a demonstration for this, albeit a rather bad demonstration.

Now in efficient causes it is not possible to go on to infinity, because in all efficient causes following in order, the first is the cause of the intermediate, and the intermediate

cause the cause of the ultimate cause. . . . Now to take away the cause is to take away the effect. . . . Therefore, if there be no first cause among efficient causes, there will be no ultimate, nor any intermediate, cause. But if in efficient causes it is possible to go on to infinity there will be no first efficient cause, nor any intermediate efficient causes; all of which is plainly false. (ST I q2,a3 p. 22)

The main trouble with this passage is that it begs the question at issue. If one is seriously entertaining, in order to refute, the idea that efficient causes can ‘go on back to infinity,’ then one is entertaining the possibility that there was no first cause to ‘take away.’ Aquinas addresses the question of whether there must be first causes and begins by assuming that there is a first cause, as if there *must* be. His reference to ‘the first’ *presupposes* that “in all efficient causes following in order” there *is* a first, and it is no surprise that, while maintaining this presupposition by continued use of ‘the first,’ he derives an absurdity supposing there is not a first!! That is trouble enough for Aquinas’s demonstration against infinite regresses of efficient causes, but there is more. When he gets into his demonstration, having fastened on the fact that, by allowing for argument an order of efficient causes that does not go to infinity to go to infinity, one ‘takes away from it a first cause’, Aquinas slides to the idea that, by exercising that allowance, one ‘takes away from that order what was its first cause’! Suppose, however, that you had, as Frank Ramsey once wrote, ‘the power of the almighty,’ and you were actually to allow a series S of efficient causes that begins with A not to begin with A or anything, but ‘to go on from A to infinity’. Suppose you were to ‘allow’ that, by prefixing to that series a beginningless series of efficient causes leading to the first cause C of S. Then you would have taken away from that cause C the role of first cause, without assigning this role to some other cause in the now much longer series. But you would not have ‘taken away’ C. You would not, by taking it away, and thereby, since it is needed for its effect, and that for its effect, and so on, have precipitated a ‘collapse of the order’ and the elimination of all effects that had been subsequent to it. You would not have *deleted* a from the series, but rather, in allowing series S to go to infinity, you would *added* to it, so that in the now much longer series there was a cause for every cause, whereas in S there had been a cause only for every cause other than C. “The [maker of this] infinite series is not ‘taking [C] away.’ He is [only] taking away the privileged status of [C] . . . its ‘first causiness’” (Edwards 1967, p. 105).

4.4 A remarkable inconsistency in the Summa. Notwithstanding his argument in the Second Way that would show that “in efficient causes it is not possible to go on to infinity” (ST I q2,a3 p. 22), Aquinas in another place in the *Summa* takes up the suggestion that Aristotle proved that ‘in efficient causes there cannot be an infinite series’ (St q46,a2 p. 453) and says (I now paraphrase), ‘No he did not, for it is not true’ (ST q46,a2 pp. 454–5). He says that though “[I]n efficient causes it is impossible to proceed to infinity *per se* . . . for instance,

that a stone be moved by a stick, the stick by the hand, and so on to infinity . . . it is **not** impossible for a man to be **generated** by [a] man to infinity” (loc. cit.; bold emphasis added). What would be impossible, he elaborates, would be for “the generation of this man [to depend] upon this man, and on an elementary body, and on the sun, and so on to infinity” (loc. cit.). This would be a series that begins with a generating cause and goes on into an unending series of sustaining causes. The impossibility, Aquinas suggests, is with the sustaining-cause section. The trouble for Aquinas is that: (1) he intends in his Second Way a proof that, if good, would establish that infinite regresses of efficient causes of *all* kinds are impossible; though (2) he maintains elsewhere that infinite regresses of *some* kinds of efficient causes are *not* impossible. Aquinas’s problems with infinite regresses may be compounded, for though he says in one place that it is not impossible that there should be infinitely many generations of men (ST q46,a3 p. 455), he implies in another that *precisely this* regress is impossible (ST I q7,a4 p. 61).

4.5 Aquinas against actually infinite multitudes. Aquinas had an argument that he could, with some plausibility, have directed specifically against infinite regresses of *concurrent* causes, as in ‘the hand that moves the staff that moves the stone’. It is an argument that Cantor might have considered not so bad. If there were an infinite regress of concurrent causes leading to some effect, there would be **the infinite multitude of them** and, according to Aquinas, “it is impossible that there be an actually infinite multitude” (ST I q7,a4, p. 61).

[T]hey [Avicenna and Algazel, and others] said there can be actually an . . . infinite multitude. This, however, is impossible, since every kind of multitude must belong to a species of multitude. **Now the species of multitude are to be reckoned by the species of numbers. But no species of number is infinite**, for every number is multitude [quantity?] measured by one. **Hence it is impossible that there be an actually infinite multitude.** . . . Furthermore, multitude in the world is created, and everything created is comprehended under some definite intention of the Creator. . . . Hence [again] everything created must be comprehended under a certain number. Therefore it is impossible for an actually infinite multitude to exist.” (ST I q7,a4 pp. 61–2; emphasis added)¹¹

Cantor quotes these words (Cantor 1932, p. 403) and, we are told, “states repeatedly . . . [that their passage contains] the only . . . really significant objections that have ever been raised against the actual infinite” (Rucker 1984, p. 49). Aquinas argues here against the possibility of infinite multitudes of either created things, such as sensible efficient causes and hotel rooms, or uncreated things, such as the numbers themselves. He then, for good measure, uses the premise that there is not an infinite number to argue *specifically* against the possibility of infinite multitudes of *created* things. After that comes an argument for the nature of ‘definite intentions’.

“Cantor [we are told] remarks in his discussion...[that Aquinas’s argument] against the existence of actually infinite collections is to be met *positively* by exhibiting a theory of infinite numbers” (Rucker 1984, pp. 49–50). There is, however, another possible response to that argument, since it is not after all obvious that there needs to be for every multitude a ‘number.’ “What is in the name ‘number?’” Cantor has made us want to speak of transfinite numbers. Suppose, however, that, notwithstanding his persuasion, we were, for ‘broadly pragmatic reasons’ (Rudolph Carnap),¹² moved to desist from the practice and take back the word to its ‘home’ in the finite, the numbers ‘measured by one,’ the numbers $1, 2 = 1 + 1, 3 = (1 + 1) + 1$, and so on. ‘Would not an erstwhile infinite multitude by any other name, or even by no distinguishing name, remain as multitudinous?’ ‘Would not an erstwhile multitude that is not finite remain *a multitude*?!’ The species of multitudes are not *necessarily* reckoned by the species of number. There is *prima facie* the possibility of ‘multitudes beyond number’. Whether it is realized depends on what multitudes there are and what numbers there are. Cantor himself believed in the existence of absolutely infinite and unlimited multitudes that are not subject to further increase. It is a good guess that he would have said, or proposed, that at least these multitudes of absolute infinity are not ‘numbered’ or made up of numbers of things. What we want, therefore, is a direct demonstration of the impossibility of some or all **actually infinite multitudes** that does not run in terms of what kinds of **numbers** there are and are not. We want to see how, if infinite multitudes are impossible, the supposition of one leads, without regard to possible limitations on numbers, to a contradiction or ‘evident absurdity’. Galileo can seem to have inadvertently obliged.

4.6 ‘Galileo’s Paradox’. Consider some possible infinite regress of causes and effects. Let these be, starting with the latest, which is an effect but not yet a cause, c_1, c_2 , and so on. Suppose there is a *multitude* C of these. Then there is the multitude C’ that is C less the latest member c_1 . *There ARE more causes in C than in C’*; there is *one* more, namely, c_1 . However, *there ARE NOT more causes in C than in C’*, for their causes can be paired one to one.

C	c_1	c_2	c_3	\dots
	\Downarrow	\Downarrow	\Downarrow	
C’	c_2	c_3	c_4	\dots

From this contradiction we may conclude that, contrary to our supposition, there is not a multitude of these causes, *or of any things*, for nothing in this little *reductio* depended on the c ’s being causes. For another *reductio*, there would be, on the supposition that there is the infinite multitude C, the multitude C’’ of exactly the odd-numbered causes in C: There would evidently be more causes in C than in C’’, namely, all the even-numbered causes in the regress, and there

would not be more given that causes in C and C'' can be paired one to one.

C	c_1	c_2	c_3	\dots
	\Downarrow	\Downarrow	\Downarrow	
C''	c_1	c_3	c_5	\dots

Similarly, also, for C and the multitude C''' of the 'square numbered causes' $c_1, c_4, c_9,$ and so on. This case corresponds to Galileo's own example (Rucker 1984, p. 5). These examples can persuade that *no* multitude is infinite. For any multitude that would not be finite. And every multitude of things that is not finite includes, for every finite number, a distinct thing.¹³ But then, the arguments go, there would be another multitude that both included more things and did not include more things, which is impossible.

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RESOLUTIONS. Given that C is a multitude, each of C' and C'' would be a 'proper submultitude' of it that included precisely some but not all of the things in C. Each, though a proper submultitude of C, would be such that there is a 1-1 correspondence of its members and the members of C. So far no contradiction. A contradiction emerges only when seemingly innocuous principles for multitudes are consulted, according to which (i) there are not more things in multitude M than there are in multitude M', if *there is a 1-1 correspondence* of their members, and (ii) there are more things in M than there are in M', if M' is a *proper submultitude* of M. We cannot have both of these principles for all multitudes *and* have infinite multitudes, which means that we *can* have infinite multitudes if we are prepared to restrict one or the other of these principles to *finite* multitudes. Aquinas could himself have been persuaded, for he believed in the finite numbers and, if challenged, could have felt compelled to say there is the multitude of them, which would be demonstrably *not finite*: It would be for every finite number n, of a greater size than n, for it would include not only the finite numbers through n, but also the next one (n + 1). Unless he was prepared to say that though there *are* finite numbers, 'ever so many' of them, there is not a *multitude* of them, Aquinas would need to say that at least one of those principles has to go when we get to infinite multitudes.

Galileo took from his 'paradox' not that there are no infinite quantities, but that "we cannot speak of infinite quantities as being the one greater or less than or equal to another" (Galileo 1914, p. 26, as quoted in Rucker 1984, p. 5). The minimal truth he demonstrated was, however, that we cannot speak of them in these respects *in all of the ways in which we speak of finite quantities* or subject them to all of the constraints in place then. To speak of them as greater, less, or equal, we must choose for them between (i) and (ii). Galileo was not prepared to choose one and concluded that infinite multitudes, the *reality* of which he did not impugn, are *incomparable*. The choice we have taken from Cantor is

to hold on to (i) while restricting the proper submultiplicity condition to finite multiplicities. In this way we can ‘have’ comparable infinite multitudes.

4.7 Actual infinities of concurrent real things. There are no prospects for persuasive demonstrations of the impossibility of actually infinite multitudes, for there are the infinitely many numbers 1, 2, 3, and so on, there *is* this ‘many’, which it is so easy to term a ‘multitude’. Perhaps, however, some would-be infinite multitudes of *real* things, of ‘created’ things, Aquinas would say, are to be rejected as *impossible*. I consider an unlikely candidate for this office, and then a family of more likely candidates.

4.7.1 Hilbert’s Hotel

[L]et us imagine a hotel with an infinite number of rooms, and let us assume that . . . all the rooms are occupied. . . . [W]hen a new guest arrives and asks for a room, the proprietor exclaims, “But of course!” and [all at once] shifts the person in room 1 to room 2, the person in room 2 to room 3, the person in room 3 to room 4, and so on [thereby freeing up a room – specifically, room 1 – of the previously fully occupied hotel, and this without sending a single guest packing]. . . . [S]uppose an *infinite* number of new guests arrive asking for rooms. “Certainly, certainly!” says the proprietor and he proceeds [all at once again] to move the person in room 1 into room 2, the person in room 2 into room 4, the person in room 3 into room 6, the person in room 4 into room 8, and so on. . . . In this way, [by merely moving guests from one room to another in the fully occupied hotel] all the odd-numbered rooms become free, and the infinity of new guests can . . . be accommodated. (Craig 1979, pp. 84–5)

What a marvellously accommodating hotel!¹⁴

Hilbert’s Hotel is Galileo’s Paradox ‘in concrete.’ Contrary to William Craig, it does *not* show how “a basic exposition of the Cantorian system . . . [can] make . . . obvious that it is impossible for an actual infinite to exist in reality” (op. cit., p. 72). Difficulties with the hotel are practical and physical. Where could it be? Where is there room for it? Of what could it be made? Vast forests would be needed to build it of wood. *Really* big ones if its rooms are of one size. How much time would be needed for all of the room changes required to accommodate infinitely many new guests to take place? Would not some need to be to rooms very far removed from guests’ old rooms? Such questions invite science fiction responses, which is to say they bring out the physical impossibility of this particular infinity of concurrent real things, not its logical impossibility.¹⁵

4.7.2 Infinite regresses of per se causes. More likely candidates for impossible infinities of real things are what would be infinite regresses of what Aquinas termed ‘per se causes.’ Whatever exactly was his idea of this causation (if he had an exact idea of it), it affords examples of infinite regresses that can seem to be impossible on *a priori* grounds found in this idea.

4.7.2.1. Per se efficient causation would, I assume, include as a case concurrent sustaining efficient causation of things by more fundamental things, though, from what little Aquinas says, one gathers that per se efficient causation would not be confined to sustaining efficient causation. He gives as an illustration of an infinite regress of per se efficient causes that he considered impossible, “that a stone be moved by a stick, the stick by the hand, and so on to infinity” (St q46,a3, p. 455). The causation involved here is *neither* generating *nor* sustaining, though, as in sustaining causation, the cause, the moving hand, is here *contemporaneous* with the effect, the moving stick, and their ‘actions,’ their relevant motions, are simultaneous. The causation here is not efficient for the existence of things, but is for changes in things: This case of per se causation is more relevant to Aquinas’s First Way of ‘motion’ than to his Second Way of ‘efficient causes.’ Aquinas’s only other illustration of an impossible regress per se is that “if the generation of this man depended upon this man, and on an elementary body, and on the sun, and so on to infinity” (ST q46,a2 p. 455). The causation would be first generating, this man by this man, and then sustaining, this man on an elementary body, that body on the sun, and so on to infinity.

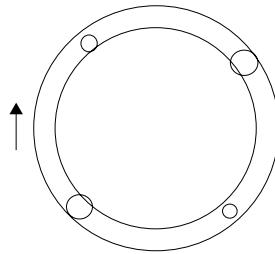
Rowe speculates plausibly – reading an account due to Duns Scotus (c1265–c1308) back into Aquinas (c1225–1274) – that, for Aquinas, per se efficient causation is causation that includes the condition that “‘the second depends upon the first precisely in its act of causation’ [John Duns Scotus, *Philosophical Writings*, edited and translated by Allan Wolter, New York: Nelson and Sons, 1962]” (Rowe 1975, p. 23). It is relevant to Rowe’s suggestion that Aquinas contrasts “causes that are *per se* required” with ‘accidental causes’ (ST I q46,a3 p. 455).

4.7.2.2 INFINITE REGRESSES OF CONCURRENT PER SE EFFICIENT CAUSATION SEEM TO BE IMPOSSIBLE. In per se causation an effect is to be dependent precisely for its own causal activity, if any, on its cause’s activity. This contrasts with generating causation, in which the effect is in its own generating activity, if any, typically entirely *independent* of its cause, to which it may owe only its production, its coming into existence. Cf.: “[I]t is . . . accidental to this particular man as generator to be generated by another man; for he generates as a man, and not as the son of another man” (ST I q46,a3 p. 455). It is plausible that, on account of this peculiarity of per se causation, *when concurrent* it ‘cannot go on to infinity.’ To persuade I can only present cases in which, for not entirely clear reasons, judgments of impossibility seem right to me.

4.7.2.3 CONCURRENT PER SE PULLERS AND PUSHERS. Consider a finite line of persons, each with his arms locked around the one in front of him. The first in this line is pulling the person behind him. Every other person, *merely because he is being pulled*, is pulling the person behind him – each other person is merely *transmitting* the pull upon him made by the person directly in front of him. Suppose now that the first person, the only person who is contributing any pulling, were literally ‘taken away,’ and in his place was put an infinite line

of persons without a lead member, each of whom, like all those in the original line other than its lead member, pulls merely because pulled. Is that possible? Is it possible that there should be all that pulling, given that it would all be merely *transmitted* pulling? From whence, I ask to persuade, would come the pulling being transmitted?!¹⁶ For a similar example, instead of pullers, one can have pushers.

4.7.2.4 NONCONCURRENT PER SE KNOCKERS. Bertil Strömberg has suggested that infinite lines of simultaneous pushers and pullers, each of which in its push-



ing is merely transmitting the push it receives, might be compared with a ring of finitely many ‘knockers that knock only because they have been knocked,’ with the knocking being, of course, *not* simultaneous. We have finitely many shiny smooth metal balls, say four of them, in a very smooth circular channel. Each is in turn knocked or ‘kissed’ by the ball counterclockwise to it, which stops dead in the track as the knocked ball rolls clockwise to knock the ball ‘ahead’ of it, which then stops dead while that ball rolls ahead, and so on and around and around. And when did all of this knocking begin? It didn’t. It has been going on forever with a constant velocity. Indeed, this channel and balls cascading in it is all there is, and ever has been, in this world I am imagining. This seems possible. Imagination conjures ‘an appearance of possibility’ that is evidence for the reality of the possibility that is, as far as I can see, unopposed by arguments. Why couldn’t this cascading have been going on forever and be all that there is and ever has been? Of course there are problems with what would be the perfectly frictionless track of it, and I suppose with the physics of the system, but these are problems not for the logical, but the physical, possibility of it, which is not at issue.

If a series of knocks by balls that knock only because they have been knocked, without one having ever ‘knocked of its own accord’, so that each knock is a merely ‘transmitted knock’, *is* possible, then why is a line of pushers each of whom pushes only because pushed, so that each push is a merely transmitted push, *not* possible? What is the difference that makes one possible and the other not? To my mind the ‘*foremost*’ difference is that I can *imagine* the whole ring of metal balls conducting themselves as described for a period of time, *any* period of time, but I cannot imagine the whole line of pushers present at a time. The ‘*responsible*’ difference, however, is the *nonconcurrency* of the knocking, and what would be the *concurrency* of the pushing, that would be merely transmitted knocking and pushing. That gives an edge to the question,

“From whence all this current pushing?” that the question, “From whence all this knocking?”, seems to me to lack.

4.7.2.5 ‘THE CLASSICAL CASE’ OF CONCURRENT PER SE ‘HOLDER UPPERS.’ Suppose a finite stack of elephants on elephants with the earth on the back of the top elephant and the bottom elephant standing on some ever so *terra firma*. There is a downward force on these elephants. But that ‘ground’ holds up against this force the bottom elephant, who, being held up, holds up the elephant on his back, who, being held up, holds up the elephant on his back, and so on to the top elephant, and then to the earth, which holds up nothing. Now take away that unearthly *terra firma*, put in its place an infinite stack of elephants, and look out! Look out, for there is no longer the stack of elephants, now ‘ungrounded’ but still under a downward force, must surely fall in an accelerating rush.

4.7.2.6. That – tentative argument by examples and appeals to intuition, and not by analysis and deductions of contradictions – is the best I can do to make plausible Aquinas’s idea that “there cannot be an infinite number of causes that are *per se* required for a certain effect” (ST I q46,a3 p. 455). I am persuaded by it that *sustaining causes* could not “go on to infinity” (ST I q2,a3 p. 21), for I suppose that sustaining causation would be a species of *per se* causation, that it would be *concurrent* causation of existence in which the sustaining causality of an effect was in every case from the sustaining causality of its cause. A *disadvantage* of sustaining-cause versions of the Second Way was detailed in Section 3.1. Understood as concerned with sustaining causes, this way could not be cast as from a better-known effect to The Cause. Present discussion has forwarded an *advantage* of sustaining-cause versions. Infinite regresses of these causes would seem to *be* impossible as the argument requires of its efficient causes. Another advantage turns up at the end of this chapter.

5. THE PRELIMINARY CONCLUSION (8)

“[There is] a first cause efficient causes” (ST I q2,a3 p. 22) – more fully, there is, for all sensible things that have efficient causes, a first cause that does not have an efficient cause, and that is not itself a sensible thing.

5.1. These words are open to several interpretations. It is sufficient for present purposes to attend to two of these. What these words say, according to one of these interpretations, does follow from premises (1) through (7), but interpreted this manner, the Second Way stops here, *well* short of the conclusion that God exists. Interpreted in the other manner, what these words say allows the argument to proceed to its penultimate step, which is the introduction by the words,

“[T]o which everyone [correctly] gives the name of God” (ST I q2,a3 p. 22).

of an additional premise ‘on line 9’. However, interpreted in a manner that prepares for these words, what the words for (8) say does *not* follow from premises (1) through (7). It is as if Aquinas thought that he could have (8) both ways. I think he did not see the difference, and that, to get without equivocation what he wants by valid inferences, he needed yet another premise, for which there is no support in sight.

5.2 *Two interpretations of the words for (8)*. These words, out of context, can express either

For every sensible thing that has an efficient cause, there is at least one thing that is not a sensible thing, does not have an efficient cause, and is a first cause of that thing.

$$(y)[Sy \ \& \ Hy \ \supset \ (\exists x)(\sim Sx \ \& \ \sim Hx \ \& \ F(xy))]$$

or

There is at least one thing that is not a sensible thing, does not have an efficient cause, and is a first cause of every sensible thing that has an efficient cause.

$$(\exists x)[\sim Sx \ \& \ \sim Hx \ \& \ (y)(Sy \ \supset \ F(xy))]$$

In the context of the Second Way, more likely interpretations of our words for (8) are

(8a) For every sensible thing that has an efficient cause *there is exactly one* thing that is not a sensible thing, does not have an efficient cause, and is a first cause of that thing.

and

(8b) *There is exactly one* thing that is not a sensible thing, does not have an efficient cause, and is a first cause of every sensible thing that has an efficient cause.

For any variables α , β and formula ϕ in which α but not β or any other variable is free, $(\exists\alpha) (\beta)(\phi \equiv \beta = \alpha)$ ‘says,’ as compactly as possible, that there is exactly one thing that satisfies ϕ . So (8a) and (8b) can be symbolized respectively by

$$(y)[(Sy \ \& \ Hy) \ \supset \ (\exists x)(z)([\sim Sz \ \& \ \sim Hx \ \& \ F(zy)] \equiv z = x)]$$

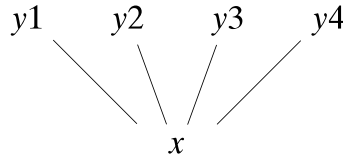
and

$$(\exists x)(z)[(\sim Sz \ \& \ \sim Hx \ \& \ (y)[(Sy \ \& \ Hy) \ \supset \ F(zy)]) \equiv z = x].$$

Other interpretations come from (8a) and (8b) by putting ‘*the* first cause’ for ‘*a* first cause’ in them. To study the ‘play’ of (8) in Aquinas’s argument, it is sufficient to attend to (8a) and (8b), which are simpler.¹⁷

To see the difference between (8a) and (8b), suppose there are only four sensible things that have efficient causes. Then (8b) ‘says’

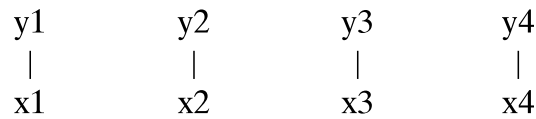
sensible things that have efficient causes



a first cause for all of them

and (8a) leaves open that

sensible things that have efficient causes



first causes for them

5.3. A path of informal deduction from (1) through (7) of *precisely* (8a) was given in Section 2.8.

From premises (1) through (6) it follows that there is, extending back or down from say this computer, a single series of efficient causes, each member of which is prior to all previous members, and so different from each of them. Given premise (7), that efficient causes cannot ‘go to infinity, there is in this series a last cause that – remember that this series is of causes of causes back or down from – is naturally termed its *first* cause.

It is reasonably obvious that no deduction is possible for (8b) from premises (1) through (7). Those premises leave open that distinct sensible things should have distinct first causes, that there should be as many first causes for sensible things as there are sensible things that have efficient causes. Premise (1) says that there are sensible things that have efficient *causes*, leaving open that their efficient causes are not the same; that *needs* to be left open in the beginning by a demonstration *quia*. That suggestion is similarly, and fortunately for plausibility and a demonstration *quia*, not made by (6), which says that sensible things that are efficient causes of sensible things have efficient causes, not that they must have one and the same efficient cause. So, when one gets in the Second Way to “**a** first efficient cause” (ST I q2a3, p. 22; bold emphasis added), one may get to *several*.¹⁸

6. THERE IS A GAP IN THE ARGUMENT

Premise (9) ‘look backs’ to (8) for its subject and is *admissible* only if it finds one there. To be admissible it is necessary that (8) should identify a unique thing to which the words ‘to which’ in (9) can refer. Inference (8b) does that,

but (8a), which is all that follows from previous premises, does not. So (9) is *not* admissible. This problem could of course be remedied by adding as a premise what we might term *Fellini*, or $8\frac{1}{2}$.

If (8a) – for every sensible thing that has an efficient cause there is exactly one thing that is not a sensible thing, does not have an efficient cause, and is its first cause, then (8b) – there is exactly one thing that is not a sensible thing, does not have an efficient cause, and is a first cause of every sensible thing that has an efficient cause.

It is not obvious that ($8\frac{1}{2}$) is true. Aquinas provides no grounds for it. It bridges a *gap* in his reasoning. There are not that I know of any passably plausible premises that, when added to (1) through (7), entail ($8\frac{1}{2}$). Cf.: “[T]here does not seem to be any good ground for supposing that the various causal series in the universe ultimately merge. . . . [T]he possibility of a plurality of first members has not been ruled out” (Edwards 1967, p. 106).

7. ON THE ULTIMATE CONCLUSION, THAT GOD EXISTS: WHETHER
THIS WOULD FOLLOW EVEN IF ALL WAS WELL IN THE
ARGUMENT TO IT

Even given ($8\frac{1}{2}$), while (9) would be ‘admissible’, its entry would remain at best *premature*. We should want to know more about this first cause of all sensible things before we were prepared to give it the name ‘God.’ What if it were not a ‘being’ but an unconscious something, say an infinitely small, infinitely potent, something that simply *exploded* eventually into all sensible things? No one would give *it* the name of God.

Suppose, however, that we not only reached in a manner that satisfied us (8b) as well as (8a), that *there is exactly one* thing that is not a sensible thing, does not have an efficient cause, and is a first cause of *every* sensible thing that has an efficient cause, but also, with reference to (8b), that we accepted and were entirely satisfied with (9),

[T]o which everyone [correctly] gives the name of God. (ST I q2,a3 p. 22)

It can seem that there would at least *then* be no room for wondering whether *God exists*, but this is not true. In saying that there *is* exactly one first cause in that sense, (8b) *may* not be saying that this one is *now*. By way of contrast, ultimate conclusion (10) is to be *precisely* that God exists *now*. The Second Way is a putative demonstration by which Aquinas would settle the question, “Whether God **exists?**” (ST I q2,a3 p. 21; emphasis added), not to the question, “Whether God **has at some time existed?**”

So (10) may not, without further ado, follow from (8b) and (9). Whether it does depends (we are back to that!) on what kind of efficient causing (8b) is about. Conclusion (10) does *not* follow without considerable further ado (more premises, more argument), *if* (8b) says only that there is exactly

one first *generating* cause of all sensible things that have efficient generating causes. For then a premise leading to (8b), and thus (8b) itself, needs to be in the popular-amongst-logicians-and-philosophers ‘atemporal present tense.’ While we ‘find’ that, (1), there exist sensible things that have efficient causes *that exist now*, we do *not* ‘find’ that, (6), every sensible thing that has been an efficient cause of some sensible thing has itself had an efficient cause *that exists now*. Generating causes of present sensible things have all done their causing for these things. Past generating causes of many past sensible things did their causing ‘generations ago.’ Many of these are, alas, long gone. “[E]xperience clearly shows that an effect may exist long after its [generating] cause has been destroyed” (Edwards 1967, p. 106). “But the *first* cause in series of generating causes leading to sensible things that we find have efficient caused would need to be still be around. *It* could not do its work, and depart.” Perhaps not, but I know of no good *reason* why not, and no reason good or bad for this is hinted in the Second Way, which would remain at best radically incomplete even after being helped to the preliminary conclusion (8b), if this is interpreted as for there having been exactly one first generating cause.

On the other hand, (10) *does* follow from (8b) and (9), if (8b) says that there is exactly one first *sustaining* cause for sensible things that have efficient sustaining causes, since sustaining causes are by definition *concurrent* causes. For presently existing sensible things, there would be presently existing sustaining causes. That (10) follows from (8b) and (9) in a sustaining-cause version of Aquinas’s Second Way is the second advantage promised some time ago for this version. Cf.: “If the argument were [good] in this form it would . . . prove the present . . . existence of a first cause” (Edwards 1967, p. 69). But then there is that first considerable disadvantage.

SUMMING UP

One can read the Second Way as a *generating-efficient cause* argument, and so read it gets off to a decent start, for we certainly do find in the world of sensible things an order of such causes. However, so read it soon runs into trouble at three points, for (i) there are no good reasons for thinking that infinite regresses of efficient generating causes are impossible; (ii) even if one could demonstrate that there has been for things that have generating causes, unique first generating causes, there are no obvious reasons why each should have had the same first generating cause as every other; and (iii) even if *that* were well-established, there are no obvious reasons why this unique first generating cause of sensible things should still exist.

The Second Way can be read instead as a *sustaining-efficient cause* argument. So read, the argument does better at two points. It is at least plausible that there could not be infinite regresses of such causes, and the transition from

(8b) and (9) to (10) would be smooth: Given that there was exactly one first sustaining cause for things that now exist that have sustaining causes, since such causes would be concurrent causes, this first sustaining cause would exist now. *The trouble* with a sustaining-efficient-cause take on the Second Way is that it makes this Way a nonstarter as a demonstration *quia* for the existence of God from effects better known than what would be His nature.¹⁹ An order in the world of sensible things of sustaining-efficient causes is not better known to us than hardly *anything*. Insofar as we can gather from its sponsors an idea of this kind of causation, it is very doubtful that there is any of it for any sensible thing, since it is very doubtful that there is, for even one sensible thing that exists at a time, anything separate from it, the existence of which at that time is necessary for the existence at that time of that sensible thing. I, for example, am not “dependent here and now on . . . the activity of the air” (Copleston 1955, p. 118) or “on an elementary body” (St I q46,a3 p. 455) unless there is one that is a part of me. The Second Way, if it is about sustaining causes, is not a way from the familiar to God, but a God-centered world-view that is far more challenged than is its God-center.

It would be nice to combine the virtues, while losing the faults, of these two versions of the Second Way in another version that ran in terms of a kind of causation that is both familiar and suited to the course. Not knowing how to do that, and suspecting that it cannot be done, I propose instead to go to a cosmological ‘way of reasons’ upgrade of Aquinas’s Second Way of causes.

APPENDIX A. NOTES ON AQUINAS’S OTHER WAYS

A1. “*The first and more manifest way is the argument from motion*” (ST I q2, a3 p. 22).

[It is manifest that things are in motion and that since nothing moves itself, each must be moved by another thing.] But this cannot go on to infinity, because then there would be no first mover, and consequently, no other mover [and thus nothing in motion]. Therefore it is necessary to arrive at a first mover, moved by no other [and indeed not itself in motion]; and this everyone understands to be God. (ST I q2,a3 p. 22)

Aquinas’s ‘argument’ against an infinite regress of movers is here the bare assertion that such regresses are impossible and that there must be for moving things a first mover.²⁰ He does not entertain – to show what is wrong with it – the putative idea of an infinite regress of moving movers in which each is “as the staff [that] moves [the stone] only because it is moved by the hand” (ST I q2,a3 p. 22) moved by a predecessor and (unless it is the last in the series) a mover of its successor. Furthermore, as in his Second Way taken as for generating causes, the argument of the First Way, even if good, would show

only that there is, in the ‘logical present,’ “a first mover” (ST I q2,a3 p. 22). It neither makes a case for there being a unique first mover nor for there existing still today any things that on days past were first movers.

The First Way of movers has these analogs of problems of the Second Way of generating efficient causes. And the First Way is vulnerable to the apparent possibility of self-moving things that have always been in motion, for Aquinas’s premise that “whatever is moved is moved by another” (ST I q2,a3 p. 22), is presumably meant to be a statement of strict metaphysical necessity. But it seems that at least things in perpetual motion could be self-movers.²¹ It seems, in Aquinas’s Aristotelian terms, that they could be at every moment things actually in motion and potentially in motion in the immediate future, their changing potentialities being continuously actualized by the action of their immediately antecedent actualities. This conception of a self-moving perpetual mover does not involve its being “**in the same respect and in the same way . . . both mover and moved**” (ST I q2,a3, p. 22; emphasis added).²²

A2. “*The third way is taken from possibility and necessity*” (ST I q2,a3 p. 22).

[Here is a paraphrase.] Given that there are possibles, it follows that there is a necessity. For what is merely possible and not necessary is sometimes not, so that if there were only possibles, there would once have been nothing. But then there would still be nothing, since there would have been nothing through which anything could begin to exist. So, since there are possibles, there is something that is necessary, and indeed (for it is impossible to go on to infinity in causes of necessities) something that is necessary in itself, something whose necessity is not caused by another logically anterior necessary thing.

Having found that there must be a necessary thing, and conceded that the necessity of necessary things can be ‘caused’ by other necessary things, Aquinas relies on his nonargument of the Second Way: He writes in the Third Way “as has already been proved in regard to efficient causes” (ST I q2,a3 p. 23). With an anti-infinite-regress premise in hand, Aquinas infers correctly that there is “some being” (ST I q2,a3 p. 23) that has its necessity of itself and not (somehow) from another necessary being, but, as *in the Second Way*, Aquinas mistakes the proposition he has reached for the conclusion that there is *some one* such being, that there is *exactly one* such being.

The Third Way runs into other difficulties peculiar to it, difficulties encountered before it ‘finds’ its necessary beings. For one, this way depends on the impossibility of a merely possible thing existing always and gives for this impossibility the inadequate grounds that “that which can not be at some time is not” (ST I q2,a3 p. 23). Even if, as a matter of fact, no contingent being exists always, it does not follow that no contingent being can exist always. There is no difficulty, far less is there absurdity, in the thought of an everlasting billiard

ball cruising the universe, or of the world of contingent things itself, which I assume Aquinas would have considered the comprehensive contingent thing, having always been.

For a second early difficulty, this Way may depend on an illicit inference of its own from “everything [in nature] can not be,” through everything in nature at some time was not, to “at one time there was [in nature, in the world] nothing in existence” (ST I q2,a3, p. 23). But even if everything at some time was not, $(x)(\exists t) \sim (x \text{ was at } t)$, it does not follow that at some time everything was not, $(\exists t)(x) \sim (x \text{ was at } t)$, or, equivalently, that at some time nothing was, $(\exists t) \sim (\exists x)(x \text{ was at } t)$. *Perhaps*, however, we should say that Aquinas has merely not highlighted a cosmic principle for the inference from ‘everything can not be’ in one sense to ‘everything can not be’ in another: It is after all plausible that the sum total of the several things, each of which can not be, must itself be a thing that can not be. This ‘creative take’ on the Third Way moves it toward cosmological arguments of the next chapter.

A3. “*The fourth way is taken from the gradation to be found in things*” (ST I q2,a3 p. 23). This Way goes immediately astray. Having observed that some beings are more and some less good, true, noble, and the like, Aquinas says that “*more and less are predicated of different things according as they resemble in there different ways something which is the maximum*” (ST I q2,a3 p. 23). In fact, more and less are sometimes predicated when it is known that there is no maximum, as in the case of greater and smaller cardinal numbers, and often without regard to whether there is a maximum, as when one object is said to be heavier, hotter, or better than another. Also, this Way, even supposing it got somewhere, would not reach its intended destination. Even if it led to “there is something which is truest, something best, something noblest,” it would not follow from that that there is something that is all of these things and thus is “most being” (ST I q2,a3 p. 23).

A4. “*The fifth way is taken from the governance of the world*” (ST I q2,a3 p. 23). This Way is from what appear to be “designedly” end-directed “to obtain the best result” actions of natural things that lack intelligence, to an intelligent being “by whom all natural things are directed to their end[s]” (ST I q2,a3 p. 23). This is an ‘argument from design’ that distinguishes itself from later ‘teleological arguments’ by being deductive. It uses the no-probabilities-about-it premise that “whatever lacks knowledge cannot [*pace*, Charles Darwin] move towards an end unless it be directed by some being endowed with knowledge and intelligence” (ST I q2,a3 p. 23). Richard Swinburne makes this point about the Fifth Way when he observes, in his discussion of arguments from design, that Aquinas’s argument moves “rather quickly” to its conclusion (Swinburne

1994a, p. 49). “It seems to me fairly clear that no argument from temporal order – whether Aquinas’s Fifth Way or any other can be a good deductive argument. . . . [as distinct from] a good inductive argument” (Ibid.).

APPENDIX B. BANGS AND INFINITE REGRESSES
OF CAUSES

B1 Big Bang!! Aquinas gives a bad argument against the possibility of infinite regresses of all kinds of efficient causes and, at times, inconsistently with that bad argument, says that infinite regresses of generating efficient causes are not impossible. “But what if the world of sensible things began a finite time ago in a Big Bang? Could there then be infinite temporal regresses of sensible-thing efficient causes for today’s sensible things?” It is likely that Aquinas would say, “No, for then there would not have been enough time.” I say, “Yes,” though given the constraint that such causes could not recede to or beyond that Big Bang time after which ‘all hell broke loose,’ infinite regresses of such causes, considered in reverse temporal order, would at some time be from then back temporally squeezed more or more closely. One manner of regular squeezing would be, for every time t subsequent to the time of the Big Bang, to have the immediate sensible-thing cause of a sensible thing’s coming to be at t , come to be itself at $t/2$. An infinite regress of the first-appearance-times of a sensible thing’s more and more remote sensible-thing causes could be: t , $t/2$, $(t/2)/2 = t/4$, $[(t/2)/2]/2 = t/8$, and so on *ad infinitum*.²³ It is true that “if there was no first event, then there must have been an event prior to any given **event**” (p. 157; emphasis added), but it is not true that there must have been an event prior to any given *time*.

*B2 A blast from the recent past – William Lane Craig’s kalām*²⁴ *causal argument*. There can be infinite beginningless temporal regresses of sensible-thing efficient causes in history, even if there was a beginning to history in the sense of a time at and before which there were no sensible things and nothing happened. This makes some trouble for Craig’s ‘basic *kalām* cosmological argument,’ which is “(1) Everything that begins to exist has a cause of its existence. (2) The universe began to exist. Therefore – (3) The universe has a cause of its existence [that did not begin to exist].”²⁵ A problem for this argument is that ‘the universe of sensible things’ could have begun to exist *in the sense that* there is time at and before which there were no sensible things and after which there were ‘fast-starting’ *beginningless* series of sensible-thing causes in which series each sensible thing begins to exist and is caused by a member of the series that began to exist earlier. In this scenario, though “the universe began to exist” in a sense, nothing happened when it did; nothing came into existence then, and in particular The Universe did not come into existence then. In this story it was only later that things came into existence, and they all had causes in the universe of sensible things that themselves came into existence at earlier times, but of course at times subsequent to the ‘beginning of history’. Relating this possibility to Craig’s argument, it is ‘philosophically

plausible' that everything that begins to exist, in the sense that there is an earliest time when it exists, has a cause of its existence. But it is 'philosophically contentious' that everything that begins to exist, *either* in that sense *or* in the sense described in which 'the universe of sensible things' could have come into existence, has a cause of its existence. The argument, to cover the possibility that it is in only the second sense that the universe began to exist, needs the contentious principle of this pair.

It may be complained that that scenario supposes that "the temporal series of past events could be **actually** infinite" (Craig 1979, p. ix; emphasis added). "Proponents of the *kalām* argument contended that it could not, and that the universe **therefore** had an absolute beginning [*when its first event or events took place*]" (Ibid.; bold emphasis added). This *kalām* argument, developed, would include an argument for Craig's second premise understood as required for an inference from (1) to the conclusion (3). This second premise would say that there is an earliest time when something in the universe existed. The issue – hotly disputed by Arabic and western non-Arabic medieval theologians – that comes up in this argument in connection with the second premise is "whether the temporal series of past events could be actually infinite" (Ibid.). I asked rhetorically in Section 4.6, "Why not?" Aquinas said that it *could* be actually infinite. He believed only in faith, and without reasons, that it is not actually infinite and that there was a time when "the world began to exist" (ST q46,a2 p. 453).

(i) it is false, if it is *a priori* determinable from its meaning that the predicate does not stand for a *bona fide* property, and (ii) it is neither true nor false, if, though the predicate does not stand for a *bona fide* property, this is not *a priori* determinable from its meaning. That would allow Mackie to say that it is false that *X is a round square* but neither true nor false that *X is objectively good*.

Chapter V

1. This sentence comes from an examination paper written by Delfina Sclauzero in Philosophy A01 at the University of Toronto in 1979–80.
2. The citation is short for ‘St. Thomas Aquinas: *Summa Theologica*, Part One, Question 2, Article 1 in *Basic Writings of St. Thomas Aquinas*, Vol. I, ed. by Anton C. Pegis, Random House, 1945, pp. 18–9.’ Citations to follow, when in this style, are all to this two-volume collection of translations by Anton Pegis writings of Aquinas that are “[w]ith one exception [selections from *Contra Gentiles* . . . drawn from the *Summa Theologica*” (p. 1). “[T]he *Summa Theologica* consists of these parts (to which a Supplement was added). . . . Each part is . . . subdivided into ‘questions’, and most of the questions contain several ‘articles’ In each article Aquinas first cites objections against the doctrine which he wishes to propose. He then exposes his doctrine or theory. . . . Finally he replies to the objections in turn in the light of the doctrine which he has explained” (F. C. Copleston, *Aquinas*, Penguin Books, 1955, p. 13).
3. But suppose I understand “the name *God* . . . to signify something than which nothing greater can be thought” (ST I q2,a1 p. 20). Then, even though the proposition *that God exists* is not self-evident to me, since this knowledge of the name’s significance is not knowledge of its subject’s essence, am I not even so in a position to demonstrate this proposition, so that it is in a *sense* ‘self-evident’ to me, the sense being that its *truth* is self-evident to me, though I do not know what this truth comes to? Aquinas says, No, but lamely, for he at least *seems* to concede to Anselm all that his argument requires: Aquinas writes that “as soon as the name *God* [signifying that than which nothing greater can be conceived] is understood it [a thing than which nothing greater can be conceived] **exists mentally**” (ST I q2,a1 p. 19; bold emphasis added). He says that even so it cannot “be argued that it **actually** exists, unless it be admitted that there **actually** exists something than which nothing greater can be thought; and this precisely is not admitted by those who hold that God does not exist” (ST q2,a1 p. 20; emphasis added). Aquinas seems to ‘give’ Anselm **existence in the mind** of a being than which nothing greater can be, thought – he seems to give that the thing **possibly** exists, as soon as these words for it are understood. I believe that Aquinas *intended* this concession, and failed to see that to concede that it ‘mentally exists’ or possibly exists is to give Anselm his argument, and to say that only a *confused* fool can resist its conclusion. This notwithstanding that he had Gaunilon’s example of exactly where to put the wrench in Anselm’s works, specifically, between having in mind and understanding words for an object, and it, an object signified by them, existing mentally, or Aquinas nearly says, possibly existing.

4. Richard Cartwright provides a minimal statement of the doctrine of The Trinity, considers some construals “to convince . . . of the difficulty of the subject,” and suggests other construals (ten others) of which “a full treatment would take account” (Cartwright 1987, p. 198).
5. “But is it not clear that the priority of the Second Way cannot be temporal, since according to Aquinas God is eternal?” No, for though Aquinas does say that God is eternal, he does not equate being eternal with being atemporal. “We . . . reach to the knowledge of eternity by means of time which is nothing but *the number of movement according to before and after* . . . Now in a thing lacking movement, and which is always the same, there is no before and after . . . in the . . . uniformity of what is absolutely outside of movement consists the nature of eternity. Further *those things are said to be measured by time which have a beginning and an end in time*” (S.T. I q10,a1 p. 75.) For Aquinas, to be ‘eternal’ is to be ‘without beginning or end’ and ‘without succession’ of states (loc. cit.). The ‘eternal’ for Aquinas includes, I think, things such as the number 4 and the proposition that 2 plus 2 is 4, as well as things such as the Northern Star could have been, contingently eternal or merely everlasting things. The number 4 and that proposition are *necessarily* ‘eternal’ for Aquinas, they are by their natures ‘eternal,’ and they are atemporal. And God? Aquinas may have thought that God is ‘a bit of both,’ necessarily unchanging and without beginning or termination like the number 4, and everlasting and at every time without beginning or end as the Northern Star could have been.
6. This ban on infinite regresses of efficient causes cannot be symbolized in our system of quantifiers and predicates using only the relational letter ‘C’ used in previous sentences. The informal deduction coming of (8) from (1) through (7) cannot be confirmed by a formal derivation in that system.
7. ‘Activity’ because it is at best one of the ‘mysteries’ of how the First Cause, God, of Aquinas’s philosophical theology could be said, without great violence to the term to be engaged in ‘*causal activity*’ now and then, even given a temporal ‘footprint’ (previous note); for Aquinas’s God would be the same at every time. Nothing would *happen* to God, and it *seems* that God would not *do* anything, ever. At least, this is how it seems to *reason*, which *might* lead Aquinas to say, “Yes, but it is otherwise in *faith*, for which speech that does violence to language is licensed.” (That position may be incoherent, for while one can license language, one cannot license *sense*, and it there cannot be belief.)
8. I ‘hear’ Louis Armstrong’s self-deprecatory, “Braggin’,” to Ella Fitzgerald in their duet of “St. James Infirmary.”
9. Essential to this modeling is that generations of chickens should be of some *minimum duration*. Without that it is conceivable that there should be infinitely many past generations of chickens even though the physical universe came into existence exactly 10,000 years ago today. See Appendix B.
10. The popular consideration, of which Aquinas *disposes* nicely in Question 46, is very similar to one that he *endorses* in Question 7. Suppose that ‘a man were to be generated by a man to infinity.’ Then an infinite series of fathers and sons would lead to this son, and this series would be “an infinite multitude . . . necessary [for this son to] exist” (ST I q7,a4 p. 61). Aquinas seems to agree with Avicenna and Algazel that “this is impossible, **because** it would mean that something is

dependent on an infinity [in time] for its existence; and hence its generation would never be accomplished, because it is impossible to traverse what is infinite” (loc. cit.; emphasis added). Furthermore, if, as I think, Aquinas in Question 7 goes along with Avicenna and company when they imply that for that reason there cannot be an infinite series of generating fathers and sons, he there contradicts what he says in Question 46, which is that “it is **not** impossible for a man to be generated by man to infinity” (ST I q46,a3 p. 455; emphasis added).

11. “Cantor’s theory has been called a theory of the actual infinite. . . . That notion of an actual infinity is sometimes contrasted with that of a potential infinity. . . . But it is not clear what this contrast, as it occurs in philosophy, comes to” (Thomson 1968, p. 186a). Some sense can be made of it for ‘developing multitudes.’ For example, if there was a first winter and there will always be winters, then one might say that winters are actually finite, though potentially infinite, whereas if there have always been winters, one might say that winters are both actually and potentially infinite. It is, however, doubtful that sense can be given to the contrast for ‘static multitudes’. Probably it is best that this traditional terminology be abandoned in these post-Cantor days, but I will abandon only the ‘potential’ half, and to maintain contact with traditional texts and discussions make liberal use of ‘actual’ and ‘actually’ in connection with ‘infinity’ though I do not intend by them a qualification or distinction. In this practice I follow the great Georg Cantor: “[I]n truth the potentially infinite has only a borrowed reality, insofar as a potentially infinite concept always points towards a logically prior actually infinite conception whose existence it depends” (Cantor 1832, p. 3).

Rudy Rucker reports that a definition of ‘potential infinity’ has been given by John Horton Conway. “Conway’s [surreal] numbers are introduced as ‘gaps’ between . . . sets” of numbers (Rucker 1984, p. 83 [85]). “He even gets a definition of the traditional ∞ for potential infinity [which] is defined as the gap between the finitely large and infinitely large surreal numbers, and Conway derives the weird equation $\infty = \Omega/\omega$ [!!], which almost magically ties together [surreal] potential infinity ∞ , the simplest [surreal] actual infinity ω , and the [surreal] Absolute Infinite Ω ” (p. 83). The use of this peculiar surreal as an explication of the traditional idea of the potential infinite has, I believe, not been tested.

12. “For Carnap . . . questions . . . about which linguistic framework should be adopted . . . are . . . purely practical questions” (Friedman 1997, p. 15). “Carnap characterizes the answers we might reasonably attempt to give . . . as both conventional and pragmatic” (p. 18).
13. If a multitude does not include a distinct thing for every finite number, then, for some finite number n , it contains distinct things only for each number no larger than n . In that case the multitude is of finite size n .
14. “But eventually we do reach a limit to this wonderful hotel’s powers of absorption: *alef-one*” (Rucker 1984, p. 75), the number of the ‘real numbers,’ the numbers whose numerals would be the ‘infinite decimals.’
15. Rucker’s hotel would be environmentally friendly. “To fix ideas, I have drawn a picture of Hilbert’s Hotel. . . . [T]o fit it on a page, I have assumed that each floor is equipped with a science-fictional space condenser, a device that makes each succeeding story two-thirds as high as the one before. The shrinking field also affects the guests” (Rucker 1984, p. 75).

16. Cf.: “The interpretation of Aquinas’s view that I propose is the following. [But see *: Rowe is offering not an interpretation, but a ‘deep analysis.’] Aquinas is *assuming* that there is or must be an explanation for the fact that causal activity of a certain sort is going on. . . . Consider . . . Aristotle’s example of an essentially order series of causes . . . the hand moving the stick that moves the stone. . . . [W]hat we want to explain is the fact that stone-moving activity is going on. Can we hope to explain this by reference to the stick? Clearly not. For . . . the stick is being caused to exhibit that activity by something else [it is pushing because it is being pushed]. . . . [S]o long as our [storied] regress of causes contains only members that are intermediate causes like the stick, there will be no explanation of the fact that this causal activity is now going on. [But] if the series progresses to infinity, each member will be like the stick, an intermediate cause [and so far there will be no answer to the question, From whence all this pushing?” (Rowe 1975, pp. 32–5). [* “It cannot reasonably be maintained that this argument is explicitly or implicitly contained in the argument Aquinas actually presents against the infinite regress of causes. . . . I offer the above . . . as a suggestion of what may underlie Aquinas’s rejection of the infinite regress of causes” (pp. 36–7)]. Thanks to Bernie Katz for making me think about pushers. For a column of ‘hangers’ see note 4 in the next chapter.
17. ‘The’ counterparts of (8a) and (8b) – (8a’). For every sensible thing that has an efficient cause there is exactly one thing that is not a sensible thing, does not have an efficient cause, and is *the* first cause of that thing. (8b’) There is exactly one thing that is not a sensible thing, does not have an efficient cause, and is the first cause of every sensible thing that has an efficient cause. These are symbolized in Russell’s theory of descriptions by $(y)[(Sy \ \& \ Hy) \supset (\exists x)(z)([\sim Sz \ \& \ \sim Hz \ \& \ \{\neg wF(wy)\} \neg wF(wy) = z] \equiv z = x)]$ and $(\exists x)(z)[(\sim Sz \ \& \ \sim Hz \ \& \ (y)[(Sy \ \& \ Hy) \supset \neg wF(wy) \ \neg wF(wy) = z])] \equiv z = x]$. (See Appendix A to Chapter II.)
18. There are affinities of Aquinas’s Second Way for the First Cause to an argument of Aristotle’s for the Highest Good. “Now, if there exists an end in the realm of action which we desire for its own sake, an end which determines all our other desires; if in other words, we do not make all our choices for the sake of something else – for in this way the process will go on infinitely so that our desire would be futile and pointless – then obviously this end will be the good, that is, the highest good” (Aristotle 1962: *Nicomachean Ethics* I, 1, 1094a17–22.) Regarding this passage, Elizabeth Anscombe remarks, “there appears to be an illicit transition . . . from ‘all chains must stop somewhere’ to ‘there is somewhere where all chains must stop’” (Anscombe 1957, p. 34).
19. There is another picky problem with sustaining-cause takes on the argument. They have some trouble with (9), which says that the unique sustaining cause delivered by (8b) for what is now that which everyone correctly gives the name ‘God’. The trouble is that there are no obvious reasons why the unique sustaining cause at one time for sensible things existing at that time should be the unique sustaining cause at any other time for sensible things existing at that time. The argument, read as for a single first presently existing sustaining cause, would leave open that this was *a being of just this moment*, and so not worthy of the name ‘God’, since worshipping, devotion, prayer, and so on, all take time. Not to solve, but to ‘bridge’ this problem, which is specific to would-be sustaining first causes, $(8 \frac{1}{2})$ could for them be enhanced.

20. Aquinas endorses several Aristotelian arguments against infinite regresses of movers in *Summa Contra Gentiles* (Bk. I, Ch. 13, secs. 12–15). The argument in his First Way is that of Section 14, whose disappointing question-begging themes are merely varied in Section 15. Section 12 harbors two arguments. One rests on the rejectable assertion that members of an infinite regress of movers could not all be moved in a finite time. The second rests on the interesting assumption that infinitely many bodies each of which was moved by another would constitute a body that was itself moved. (But would it be moving?)
21. The Athenian in Plato's *Laws* traces motion back to self-movers (894e–895b) that are souls (896a). These are not said to be in perpetual motion. The hypothesis of an infinite regress of moving movers, none of which moves itself, or moves always, is not considered in the *Laws*.
22. Aquinas endorses several Aristotelian arguments against self-moving beings in general, and perpetually self-moving beings in particular, in *Summa Contra Gentiles* (Bk. I, Ch. 13). My comments are not relevant to those arguments.
23. An argument in Sobel (1998b, Ch. 3, Sec. 8) to show that Universal Causation is consistent with Free Will exercised in 'mini-bangs' uses this construction.
24. "*Kalām* may be simply defined as 'natural theology' or philosophical theism. . . . Taken literally, *Kalām* is simply the Arabic word for 'speech'. . . . [It] became the name of the whole movement within Arabic thought that might best be called Arabic scholasticism. . . . Richard Walzer described [practitioners] as 'dialectical or speculative theologians' and noted that they . . . 'take the truth of Islam as their starting point'" (Craig 1979, p. 4).
25. Craig (1979, p. 63.) reviews the arguments of Ishāq al-Kindi (c. 801–c.873), "[u]niversally recognised as the first true philosopher of the Islamic world" (p. 19); Saadia ben Joseph (882–942), "the 'first important Jewish philosopher' [according to Isaac Husik]" (p. 38); and the thinker "generally known . . . as al-Ghāzālī" (1058–1111). Craig's basic argument is essentially al-Kindi's (see pp. 34–5). Regarding Husik's elevation of Saadia ben Joseph, Bernie Katz wonders, What about Philo (fl. 20 B.C.–40 A.D.)?

Chapter VI

1. Cf.: "But nothing can never be a cause." (Hume 1888, p. 81). Hume attributes words to this effect to *Locke* for use in a bad argument that purports to demonstrate the general principle that whatever begins to exist must have a cause for its existence. On 'nothing' see "Nothing" by P. L. Heath in *The Encyclopedia of Philosophy*, edited by Paul Edwards, New York: Macmillan, 1967, Volume 5, pp. 524–5. It is an appropriately brief edifying entertainment.
2. **N.B.** 'Contingency,' as used today in philosophy and logic, does not mean *DEPENDENCY*. Contingent beings contrast with necessary beings in contemporary terms in that, while a necessary being exists in every possible world, a contingent being exists in some but not every world. A contingent existent exists in the actual world, but not in every world. It is not settled by definition that every contingent existent depends on some other existent that is its cause or reason. This contemporary usage in philosophy and logic is reflected in the second sense mentioned in the entry, "**contingent** . . . dependent on something else: **liable but not certain to happen: accidental**" (*Chambers Twentieth Century: New Edition*).

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Index of Names

- Adams, Marilyn McCord 488, 489, 493, 621n43, 630
Adams, Robert Merrihew 30, 115, 130, 131, 133, 225, 439, 447, 454, 460, 461–5, 468, 469, 471, 473, 477–9, 556n22, 558n4, 616ns13,19, 619n31, 630
Algazel 565n10
al-Kindi, Ishāq 568n25
Alston, William 56, 261, 370, 411–13, 436, 610ns26,28, 620n39, 630
Anderson, Alan R. 630
Anderson, C. Anthony 116, 119, 120, 123, 133, 138–44, 152, 157–67, 630
Anscombe, Elizabeth 567n18, 630
Anselm of Canterbury, St. xvii, 12, 30, 40, 41, 59–66, 81, 83, 84, 96, 98–9, 137–38, 215, 490, 544n3, 545n4, 552ns46,47, 553n48, 554ns1,3, 563n30, 574n28, 630
Aquinas, St. Thomas xvii, 6, 168–99, 213, 229, 383, 564ns2,3, 631
Aristotle 13, 363, 516, 567n18, 603n1, 631
Armstrong, Louis 565n8
Arnauld, Antoine 507, 511, 529, 622n4, 631
Arnold, Matthew viii
Avicenna 565n10
Babbage, Charles 339
Basinger, David 3, 9, 12, 19, 303, 306, 437, 603n18, 639
Batens, Diderick 476, 632
Bayes, Thomas 241, 321, 592n4, 598n32
Beall, Jc 373, 631
Berg, Jan 56, 549n29, 552n44, 631
Bergmann, Michael 563n32, 610n29, 612n41, 615n11, 617n22, 631
Berkeley, George 131, 552n46, 631
ben Joseph, Saadia 568n25
Bennett, Jonathan 46, 47, 526, 631
Bernstein, Allen R. 620n36, 631
Blackburn, Simon 556n18, 631
Blair, Hugh 337
Bonevac, Daniel 110, 631
Boolos, George 384, 631
Boswell, James 266
Bowden, John 459, 640
Bowsman, O. K. 613
Boyle, A. 42, 643
Bradley, Walter L. 582n23, 644
Brown, David 268
Butler, Bishop George 569n5, 572n16, 600n49, 631
Cameron, Margaret 556n16, 601n4
Campbell, George 337, 523, 600n44
Cantor, Georg 184, 186, 369, 378–9, 383, 384, 404, 527, 535, 536, 566n11, 604n3, 631
Carnap, Rudolph 185, 590n49, 631
Carroll, Lewis 345, 631

- Cartwright, Richard 16, 350–1, 376,
 380, 555n12, 565n4, 570n9, 575n35,
 576n36, 605ns8,9, 631
 Castell, Paul 476, 632
 Charlesworth, M. J. 60, 630
 Christensen, David 317, 632
 Clarke, Samuel xvii, 201, 204–6, 207,
 208, 212–13, 215, 221, 547n20,
 569ns5,6, 570ns7,8, 571–2n16, 632
 Clarke, Steve 306, 211, 593n10, 632
 Clifford, William 500, 517, 524, 528,
 627n25, 632
 Clough, Arthur Hugh vii, 479
 Cohen, L. Jonathan 30, 599ns37,39, 632
 Coleman, Dorothy 307, 601n49, 632
 Collier, Jeremy 606n1, 632
 Condorcet-Marie-Jean-Antoine-
 Nicolas Caritat, Marquis de
 Condorcet 301, 321, 333–5, 632
 Conway, John Horton 535, 536, 566n11,
 629n30, 632
 Copleston, F. C. 172, 173, 176, 177, 195,
 564n2, 632
 Cortens, Andrew 639
 Craig, William 187, 198, 199, 287,
 568ns21,22, 588ns41,42, 589ns43,44,
 632
 Curley, Edwin 41, 42, 67, 229, 632

 Darwin, Charles 197, 273–5, 277, 290
 Davis, Martin 533, 632
 Davis, Stephen 632
 Dawid, Philip 632
 Dawkins, Richard 582n23, 632
 Dawson, John 558n3, 632
 de Falla, Lorenzo 232
 Demski, William A. 577n3, 582n23, 632
 Descartes, René xvii, 30, 31–40, 41, 42,
 56, 60, 62, 66, 80, 96, 121, 142, 215,
 346, 545ns4,6, 547n18,
 548ns24,26,27,28, 549n31, 632–3
 Diaconis, Persi 323, 325, 633
 Diderot, Denis 503
 Dorling, Jon 583n26, 633
 Draper, Paul 436, 633
 Duff, Anthony 504, 628n27, 633
 Dun Scotus, John 188
 Dye, James 308

 Earman, John 249, 283–4, 291, 293, 294,
 302, 306, 312, 317, 318, 319, 321–2,
 337, 339, 579n11, 593n6, 596n18,
 598n30,31, 600n44, 601n50, 633
 Edgeworth, Francis 334, 633
 Edwards, Paul 183, 193, 194, 633
 Einstein, Albert 274, 617n23, 633
 Ellsberg, Daniel 599n37, 633
 Elwes, R. H. M. 547n21, 643
 Epicurus xviii, 260, 263, 436

 Fales, Evans 261, 580n13, 633
 Falk, David (W. D.) 526, 633
 Falkenstein, Lorne 265
 Findlay, John 9, 11, 12, 14, 136–7, 352,
 361, 364, 403, 554n3, 571n13, 602n13,
 606n6, 633
 Fine, Kit 104, 633
 Fischer, John Martin 8, 486, 488–9, 490,
 491–3, 633
 Flew, Anthony 307, 617n23, 633
 Forrest, Peter 473, 633
 Fox, Everett 539n1, 540n3, 540n4, 633
 Fraenkel, Abraham Adolf 606n15
 Freedman, David 323, 325, 633
 Friedman, Michael 227, 566n12, 633
 Frost, Robert 238
 Fulmer, Gilbert 278, 633

 Gale, Richard 573n24, 613n3, 633
 Galileo, Galilei 186, 634
 Gaskin, J. C. 268, 580n16, 635
 Gassendi, Pierre 33, 545n6, 547n18
 Gaunilon 30, 46, 65, 66, 70, 80, 545n9,
 554n1, 557n22, 563n30
 Geach, Peter 20, 21–3, 345, 360, 367,
 603n17, 634
 Gellman, Jerome 5, 8, 9, 553n48, 634
 Gelly, Dave 10, 634
 Gershwin, George and Ira 587n37, 634
 Gettings, Michael 562n30, 634
 Gibbard, Alan 634
 Gillies, Donald A. 596n19, 632
 Gödel, Kurt xvii, 30, 66, 92, 105,
 115–67, 274, 558–64, 634
 Goldstein, Laurence 546n14, 634
 Gooch, Paul 589n45
 Gould, Stephen Jay 273

- Gower, Barry 299–300, 634
 Grim, Patrick 369–93, 603n2,
 604ns3,6,7, 605ns11,12, 606ns13,16,
 634
 Grover, Stephen 472, 634
- Hacking, Ian 40, 117, 283, 546n12,
 624n12, 634
 Hailperin, Theodore 411, 415, 611n34,
 634
 Hájek, Alan 535, 634
 Hájek, Petr 535, 634
 Hallett, William 380, 634
 Hansen, Kay Borge 560n19
 Hartle, J. 285, 588n42
 Hartshorne, Charles xvii, 19, 30, 64, 66,
 67, 80, 81–6, 87, 89, 90, 98, 105, 106,
 112, 115, 121, 137, 554n2, 557n23, 634
 Hasker, William 3, 5, 6, 9, 12, 17, 19,
 303, 306, 437, 603n18, 634, 639
 Hawking, Stephen 226, 285–6, 574n27,
 588ns40,42, 634
 Hazen, A. P. 119, 559n13, 562n27, 634
 Heath, P. L. 568n1
 Heller, Joseph 603n*
 Hellman, Geoffrey 386, 634
 Henle, James M. 532, 534, 634
 Hersh, Reuben 533, 632
 Herzog, Roger 540n4
 Herzog, Shirley Goldman 540n4
 Hicks, John 56, 444–7, 635
 Hintikka, Jaako 56, 635
 Hitchens, Christopher 309, 635
 Hitching, Francis 272, 273, 635
 Hodges, Wilfrid 397, 634
 Holton, Richard 501, 635
 Hook, Donald D. 540n4, 635
 Howard-Snyder, Daniel and
 Francis 476–7, 614n7, 635
 Hudson, Hud 218, 219, 556n20, 635
 Hume, David xvii, 18, 29, 30, 43, 45, 92,
 94, 98–9, 128, 201–2, 204, 206, 215,
 215–7, 225, 238–88, 290, 296, 297,
 298–341, 345, 405–9, 429, 430, 436,
 499, 508, 544ns1,3,4, 546n11, 547n20,
 568n1, 571n12, 572n17, 577n2,
 592ns1,4,5, 593ns5,6,8,9,10,
 594ns12,13, 595n16, 596ns20–4,
 597ns27,28, 598ns29,30,32, 599n34,
 600ns44,45, 601n48, 607ns9–12,
 608n13, 610n28, 635
 Hunt, David 480, 621n40, 635
 Hunter, Daniel 504, 635
 Hunter, Geoffrey 396, 397, 521, 532,
 533, 534, 635
 Husik, Isaac 568n25
 Hutton, James 581–2n22
 Huxley, T. H. 625n15, 635
- Jakubowicz, Sammy 629n29
 James, William 19, 499, 501, 502, 504,
 505, 507, 514, 515, 520, 524, 528, 532,
 625n13, 627n25, 636
 Jeffrey, Richard C. 251, 387–8, 472, 507,
 508, 514, 523, 578ns6,8, 579n12,
 599n36, 619n35, 636
 Johnson, David 312, 315, 327, 544n17,
 558ns5,7, 561n22, 577n3, 593n7,
 595n15, 596ns23,24, 601n47, 636
 Jones, Jean 581n21, 636
 Jordan, Jeff 503, 636
- Kahneman, D. 328, 644
 Kalish, Donald 47, 105, 553n54, 554n56,
 636
 Kant, Immanuel 66–70, 201, 202, 311,
 393, 526, 561n21, 569n3, 577n2,
 583n24, 614ns6,10, 636
 Kaplan, Aryeh 581n21, 636
 Katz, Bernard 540n2, 567n16, 568n25,
 574n27, 580n18
 Kauffmann, Stuart 582n23, 636
 Keller, James A. 302, 303, 306, 595n14,
 596n20, 636
 Kenny, Anthony 178
 Kenyon, Dean H. 582n23
 Kierkegaard, Soren 624n8
 Kilmer, Joyce 238
 Kimel, Alvin F. 540n4, 635
 King, Jeffrey 546n14, 636
 Kleinberg, Eugene M. 532, 534, 634
 Kohlenberger, J. R. III 7
 Koons, Robert 234–7, 573n23,
 574ns37,38,39, 613n45, 624n8, 636–7
 Kraay, Klaas 459
 Kripke, Saul 541n9

- Kremer, Elmar 574n27, 580n18
 Kronecker, Leopold 534
- Langtry, Bruce 615n10, 619n30, 637
 Laplace, Pierre Simon, Marquis de
 Laplace 241, 242, 246, 320, 321, 324,
 325, 386, 592n3, 637
 Leibniz, Gottfried xvii, 30, 32–3, 34, 46,
 56, 66, 67–8, 80, 89, 115, 119, 121, 122,
 134, 137, 142, 201, 202–4, 208–14, 215,
 217, 220, 222, 226, 228–33, 234 383,
 440–1, 442, 451, 454, 468, 479, 544n2,
 545n7, 559ns11,13, 568–9n2, 569n4,
 571n11, 574n24, 574ns29,30, 637
 Leslie, John 214, 226, 233–4,
 571ns14,15, 574n27, 637
 Lewis, David 35, 66, 93, 100–3, 141, 219,
 466, 549ns29,31, 550n36, 552n46,
 556n20, 615ns11,12, 625n13, 637
 Lindström, Sten 562n24, 637
 Locke, John 568n1
 Lowe, E. J. 226, 637
 Lycan, William 520, 521, 531, 637
 Lyell, Charles 582n22
- Mackie, John 25, 214, 233, 263, 272, 274,
 308, 310, 311, 312, 351–2, 407, 443,
 444, 447, 455, 458, 460, 544n18,
 564n32, 602n8,10, 637
 Maimonides 543n16
 Malcolm, Norman 81–2, 86, 89, 91–2,
 96, 637
 Mann, William E. 602n9, 637
 Mar, Gary 47, 105, 553n54, 554n56, 636
 Marina, Jaqueline 593n8, 637
 Martin, William 627n23, 638
 Mavrodes, George 526, 602n7, 606n7,
 638
 Maxwell, Grover 613
 McClennen, Edward C. 625n13, 638
 Meierding, Loren 262, 291, 591n53, 638
 Menzel, Christopher 378, 638
 Mill, John Stuart 311, 597n27, 638
 Milnor, John 144, 145
 Molina, Edward C. 321, 638
 Molina, Luis 463
 Montague, Richard 47, 105, 553n54,
 554n56, 636
- Monton, Bradley 577n6, 638
 Moore, G. E. 17, 67, 120, 123, 229, 232,
 234, 442, 444, 525, 610n29, 638
 Morgenstern, Oskar 116
 Morris, Thomas 12, 14, 21, 347, 364–5,
 367, 472, 473, 638
 Mossner, Ernest Campbell 582n22, 638
 Mura, Alberto 300, 638
- Nadler, Steven 622n4
 Nagel, Thomas 561n21, 638
 Nahknikian, George 13
 Nalebuff, Barry 534, 638
 Neale, Stephen 639
 Nelson, Mark T. 570n7, 576ns38,39, 639
 Newton, Isaac 240, 274, 639
 Niiniluoto, Ilkka 600n41, 639
 Nozick, Robert 263, 629n28, 639
- O’Leary-Hawthorne, John 639
 Olsen, Roger L. 582n23, 644
 Oppy, Graham 545n9, 551n43, 562n30,
 586n33, 639
 Otte, Richard 590n49, 639
 Owen, David 301, 639
- Pascal, Blaise 499–532, 622n2, 624n11,
 626n18, 639
 Pearson, Karl 334, 599n33, 639
 Pegis, Anton C. 564n2, 631
 Pelletier, Jeffrey 563n30, 606n16
 Penelhum, Terence 35, 545n10, 601n2,
 639
 Pereboom, Derk 577n2, 614n6, 639
 Peterson, William 3, 9, 12, 19, 303, 306,
 437, 603n18, 639
 Philo 568n25
 Pike, Nelson 480, 483, 621n42, 640
 Plantinga, Alvin xvii, 19, 30, 66, 68–9,
 80, 86, 87, 89, 92, 93, 96, 98, 105, 121,
 312, 361, 415, 422, 436–7, 439, 447–60,
 461, 468, 469, 471, 473, 481, 521,
 545n9, 55n10, 556n19, 557n22,
 603n16, 604n6, 605n12, 606n4, 607n9,
 611ns34,37, 614n10, 616ns13,16–9,
 623n42, 640
 Plato 442, 526, 568n21, 571n14
 Polanyi, Michael 582n23

- Plotinus 571n13
 Price, Richard 20, 21–3, 99, 301, 321,
 323–8, 329, 563n30, 599n34, 640
 Prior, Arthur 104
 Pruss, Alexander R. 572n20, 573n24,
 640
 Putnam, Hilary 18, 95, 491, 543n16, 640
- Quinn, Philip 34, 640
- Rabinowicz, Włodzimierz 548n23
 Ramsey, Frank P. 56, 183, 387–8, 640
 Rashi 539n1
 Raynor, David 327, 640
 Reagan, Ronald 432
 Reichenbach, Bruce 3, 9, 12, 19, 303,
 306, 437, 603n18, 639
 Rescher, Nicholas 515, 531, 625n16, 640
 Richardson, Alan 459, 640
 Robinson, Abraham 510, 535, 536,
 629n30, 640
 Root, Michael 597n28, 640
 Rosen, Gideon 102, 640
 Ross, W. D. 603n2, 640
 Rowe, William 9, 13, 16, 20, 23, 66, 70,
 92–4, 97, 177, 178, 188, 204, 206, 207,
 212–3, 221, 345, 353, 361, 362, 363,
 409–27, 432, 437, 449, 469, 555n13,
 567n16, 609ns20,24, 610ns25,30,
 611ns32,33,35,37, 612ns39,40, 613n1,
 621n1, 640–1
 Rucker, Rudy 184, 185, 186, 379, 383,
 384, 397, 566ns11,14,15, 629n30, 641
 Russell, Bertrand 40, 56–8, 70, 79, 80,
 567n17, 614n8, 641, 645
- Salmon, Nathan 557n25, 641
 Salmon, Wesley 241, 258, 292,
 581ns19,20, 641
 Savage, C. Wade 602n7,11, 641
 Schellenberg, J. L. 18, 556n13, 606n2,
 641
 Schlesinger, George 519, 520, 521, 531,
 626n20, 637, 641
 Sclauzero, Delfina 225, 564n1
 Scott, Dana 115, 116, 117, 123, 124, 125,
 126, 127, 133, 134, 145, 149, 558ns1,6,
 560n15
- Seager, William 275, 589n45, 629n29,
 641
 Segerberg, Krister 562n24
 Shaffer, Jerome 546n13, 641
 Shalkowski, Scott A. 401, 641
 Shimony, Abner 282, 586n33, 641
 Shirley, Samuel 41, 42, 643
 Silverberg, Arnold 539n1, 542n12
 Simmons, Keith 373, 379, 604n3, 641
 Skorupski, John 446
 Sleigh, Robert 230, 642
 Smith, Norman Kemp Smith 241, 265,
 267, 268, 270, 635
 Smith, Quentin 279, 280, 281–2, 285–6,
 287, 586n33, 588ns40,41, 589ns43,44,
 607n8, 642
 Smolin, Lee 278, 282–3, 284, 289,
 584n28, 586–7n36, 642
 Sobel, Willa Fowler Freeman xix,
 539n2, 562n54, 589n45, 606n16,
 629n29, 642
 Sober, Elliott 583n27, 587n36, 643
 Socrates 571n14
 Sorensen, Roy 469, 503, 537, 626n20,
 643
 Sosa, David 550n33, 643
 Spinoza, Baruch xvii, 30, 40–59, 80,
 545ns4,8, 548ns25,28, 549n30, 643
 Stephen, Leslie 331, 643
 Stirton, William R. 9, 546ns12,a5,
 551n39, 643
 Strawson, Peter 101, 643
 Stroll, Avrum 5, 9, 643
 Strömberg, Bertil 189, 643
 Suppes, Patrick 377, 643
 Suarez, Francisco 463
 Swinburne, Richard 11, 14, 15, 19, 20,
 21, 32, 197, 239, 245–6, 288–91, 294–7,
 306, 314, 350, 354, 358, 359, 360, 402,
 441, 505, 506, 517, 530, 541n11, 577n1,
 589n48, 592n55, 602n13, 607n11,
 609n19, 610n28, 613n1, 621n45, 643–4
- Tatum, Art 10
 Taylor, A. E. 212, 644
 Taylor, Richard 212, 644
 Thaxton, Charles B. 582n23, 644
 Thompson, Paul 589n45

- Thomson, James 566n11, 644
 Thomson, Judith Jarvis 562n24
 Tidman, Paul 556n15,18, 644
 Todhunter, Isaac 334, 644
 Tooley, Michael 413, 644
 Tversky, Amos 328, 644
 Tweyman, Stanley 261, 270, 635
- Ussher, James 581n21
- van Cleve, James 556n15, 644
 van Fraassen, Bas 585n31, 599n36, 644
 van Inwagen, Peter 60, 89, 202, 218, 245, 246, 274–5, 278, 279, 280, 281, 283, 310, 429–31, 437, 440, 546n13, 553n51, 554n7, 560n17, 574n25, 584n29, 594n11, 613n47, 644
 Venn, John 600n41, 644
- Wainwright, W. J. 545n5, 644
 Walker, Ralph 211–2, 574n29, 644
 Waller, Fats 10
 Wang, Hao 116, 558n2,6, 645
- Wattenberg, Frank 620n36, 631
 Webber, Andreas 601n48
 Weidemann, Hermann 626n19
 Wettstein, Howard 23, 24 479, 542n12, 645
 Whately, Richard 336, 645
 White, Roger 279, 577n4, 584n28, 585n31, 586n34, 645
 Whitehead, Alfred North 56–8, 70, 79, 80, 645
 Widerker, David 359, 486, 488–9, 491–3, 494, 620n39, 645
 Wierenga, Edward 20, 358, 359, 360, 366, 491, 603n15,16, 645
 Williams, Bernard 526, 645
 Wykstra, Stephen 421, 608ns14,15,17, 645
- Yablo, Stephen 95, 352, 566n15, 645
- Zabell, Sandy 318
 Zakon, Elias 624n9, 645
 Zemach, Eddy 359, 486, 488–9, 491–3, 494, 620n39, 645