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Powers and the Metaphysics of Fundamentality

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Abstract

In this dissertation, I address the question of whether ground, the relation that obtains between entities $e_1...e_n$ and a further entity e when e ontologically depends on, and is metaphysically explained by, $e_1...e_n$, should be understood causally and, if so, whether this has any substantive implications. I answer both in the affirmative. I argue that ground and causation are similar enough to motivate characterizing ground as a special kind of causation, and that this can be done if we adopt a powers-theoretic account of causation. Moreover, I argue that the resultant view of ground, what I call "powerful, existential causation," has important consequences for the debate between foundationalists, according to whom there must exist something fundamental that grounds all else, and infinitists, according to whom being might descend infinitely with nothing fundamental. Drawing on arguments and insights of medieval philosophers such as Ibn-Sīnā, Thomas Aquinas, and John Duns Scotus, I argue that if ground is understood as powerful, existential causation a strong argument can be formulated for foundationalism over infinitism. Thus, there must exist something fundamental whose existence is ungrounded, but which grounds the existence of everything else.

POWERS AND THE METAPHYSICS OF FUNDAMENTALITY

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Chapter 1:
Ground as Powerful, Existential Causation

In this first chapter, I will propose and defend a view of ground as *powerful existential causation* (GPC). According to GPC, entities $e_1...e_n$ ground entity e just in case $e_1...e_n$ have a power to produce and sustain e in existence, and this power is manifest.[1] The theoretical payoff of accepting GPC is a more unified picture of the world: Causation and ground, two relations often thought to be entirely distinct, are in fact unified as something like genus to species. Ground is the *existential* species of (powerful) causation.

GPC is motivated by two recent trends in analytic metaphysics: that of understanding ground in terms of metaphysical causation, and understanding causation in terms of powers. I argue that these ideas are a perfect fit, and hence combine them in the form of GPC. Specifically, powers theories of causation undermine two key claims thought to create a barrier to understanding ground as metaphysical causation: (1) Causation is *diachronic*, whereas ground is *non-diachronic*, and (2) Causation is a *contingent* relation, whereas ground is a *necessary* relation. Contra (1) and (2), *powerful* causation is just as non-diachronic and necessary as ground is. A twofold barrier to a causal understanding of ground is thus removed by the powers theory of causation.

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[1] Following Schaffer (2009; 2012), I take ground to relate entities rather than facts or propositions. Those favoring a facts/propositions approach may interpret subsequent talk of entity-grounding as elliptical for claims about facts *involving*, or propositions *referring to*, those entities. GPC is not, however, entirely theory-neutral on this point. One cannot consistently endorse, for example, that (1) facts/propositions cannot be causal relata, (2) facts/propositions are the grounding relata, and (3) grounding is a causal relation. The core commitment of GPC is (3), and thus forces the rejection either of (1) or (2). (Thanks to an anonymous referee for bringing this issue to my attention.) Alternatively, my view may be translated in terms of whatever distinct relation one *does* think relates entities (say, a more restrictive notion of "ontological dependence").

It is not my concern in this chapter, however, to argue *individually* either for the powers theory of causation or for the claim that ground is metaphysical causation. Instead, my concern is only to argue that the *combination* of these views provides an illuminating, and theoretically fruitful, account of ground. And, in the proceeding chapters, to show that the account has substantial implications for the debate between infinitists and foundationalists about ground.

I proceed as follows. I begin in §1 with some stage-setting, tracing how the purported tension between ground and causation has arisen in the literature. In §2, I explicate the powers theory of causation, showing how it undermines assumptions (1) and (2) above. In §3, I argue that if ground is to be understood as a species of causation at all, then it is best understood as *existential* causation. In §4, I formulate and unpack GPC, and show how it closes the gap generated by (1) and (2). In §5, I address potential objections to GPC. Finally, in §6, I summarize and conclude.[2]

§1 **Ground versus Causation**

Ground, as I will understand it in this thesis, is a metaphysical relation which is *logically* a strict partial order[3], and *substantively* a relation of existential or ontological dependence. Where $e_1...e_n$ ground e, e ontologically depends on $e_1...e_n$.[4] Moreover, it is a "structuring" relation: Ground hierarchically arranges reality into the more and less fundamental. If $e_1...e_n$

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[2] GPC was inspired by the views of medieval philosophers Avicenna, Aquinas, and Scotus. In their work, a notion of efficient causation as one thing "bestowing existence" on another, or one thing "participating in" another's existence, can be found. This medieval history is instructive for understanding why contemporary philosophers have sharply divided ground and causation, and what implications their reunification might have. This is the subject of Chapter 2.

[3] That is, irreflexive, asymmetric, and transitive.

[4] I follow those who treat ground and ontological dependence as equivalent, though some prefer to distinguish the notions. For discussion of "equivalence" approaches, see Correia and Shchnieder (2012, p. 24-25). For the opposite approach, see Audi (2012, p. 108). Again, one is free to think of the view in whichever terms they believe most fitting.

ground e, $e_1...e_n$ are more fundamental than e, as e depends for its existence on $e_1...e_n$ but not

conversely. Paradigmatic cases of ground include the members of a set grounding that set,

determinates grounding determinables, and parts grounding wholes.[5]

That ground is an "existential" relation in the above sense is partly constitutive of its

being the relation that it is—a fact that will become important for the view to be developed in

what follows. According to Morganti (2018), for example, "grounding relations...determine in

virtue of what (some of) the things that make up material reality exist as the very things that they

are. This is tantamount to saying that...'a grounds b' is more or less a synonym of 'b depends on

a for its existence/essence/identity'" (p. 256). Similarly, in Schaffer's view "a grounded entity

inherits its reality from its grounds" (Schaffer 2016, p. 95). This feature of ground also plays a

crucial role in first-order debates about the notion, such as that between so-called "infinitists"

and "foundationalists" about whether there must be something fundamental (a debate that I will

attempt to settle in Chapter 3). That debate is often cast in terms of whether there must be a

"source" of the being that grounded entities inherit from their grounds.[6] It is thus generally

assumed that, whatever else an entity's grounds might be responsible for, they are at least

responsible for its existence.

It was noted early in the contemporary grounding literature that ground has interesting

connections to causation, so much so that it was sometimes loosely referred to as "metaphysical"

causation.[7] Both relations back explanations, for example, and have the same logical profile of a

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[5] Throughout this chapter I generally refer to grounds in the plural and that which is grounded ("groundees") in the singular, though in my view it's perfectly possible that any number of entities might be related by ground; any number on either side.

[6] See for example Schaffer (2010) and Trogdon (2018a).

[7] For example, in Schaffer (2012): "Grounding is something like metaphysical causation....just as causation links the world across time, grounding links the world across levels." (p. 122).

strict partial order.[8] However, it quickly became commonplace to insist that ground and causation were nevertheless distinct, loose analogies notwithstanding. For example, according to Fine (2012), "...in addition to scientific or causal explanation, there may be a distinctive kind of metaphysical explanation, in which explanans and explanandum are connected, *not through some sort of causal mechanism*, but through some constitutive form of determination" (p. 37; emphasis mine). Along similar lines, Audi (2012) has written "it is the fact that there are such [in-virtue-of] explanations, together with the fact that their correctness *cannot be underwritten by any causal relation*, that makes it incumbent on us to recognize grounding" (p. 101; emphasis mine).

This insistence that ground and causation be distinguished seems primarily have arisen primarily from two purported disanalogies: (1) Causation is *diachronic*, whereas ground is *non-diachronic*, and (2) Causation is a *contingent* relation, whereas ground is a *necessary* relation.[9] We can see something like assumption (1), for example, in Barker's (2012) passing comment that "[w]e are very familiar with causal making...It occurs *through time* linking events. Non-causal making [ground] is *atemporal* and operates through levels of reality" (2012, p. 272; emphases mine).[10] Expressing a similar thought, Bohn (2018) has written,

> Grounding is like a *synchronic, static mathematical* relation...not like a *diachronic, dynamical physical* relation...Grounding is an explanation of what the obtaining of a fact consists in, atemporally; grounding is not an explanation of the causal history of that fact (p. 170; emphasis in original).

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[8] Rodriguez-Pereyra (2015), however, questions this.
[9] Skiles (2015) similarly questions mainstream opinion here.
[10] Presumably "atemporal" is here used as synonymous with "synchronic" (i.e., at the *same time*), as opposed to the *timeless* sense of the term I assume in proceeding sections.

Additionally, the modal difference asserted in (2), that ground is necessary whereas causation is contingent, is typified by this passage in Rosen (2010):

> The facts that ground [p] together ensure as a matter of *metaphysical necessity* that [p] obtains. This is one respect in which the grounding relation differs from causal and other merely nomic forms of determination. On the present view, there is a difference between the materialist who holds that the facts about phenomenal consciousness are grounded in, and hence necessitated by, the neurophysiological facts that underlie them, and the dualist for whom the neural facts merely cause or generate conscious states *according to contingent causal laws* (p. 118; emphases mine).

Similarly Koslicki (2016), contrasting the modal profile of a case of causation with a case of ground, has asserted that "...the causal connection which obtains between [a] rock's being thrown against [a] window and the window's shattering is *not metaphysically necessary*, though it is perhaps governed by some other form of necessity, e.g., nomological necessity" (p. 107 fn.; emphasis in original).

Throughout the literature, then, causation and ground have been contrasted along the lines of (1) and (2). Consequently, it is no wonder they have been treated with near unanimity as distinct relations.

Recently, however, the analogy between ground and causation has taken center-stage in a series articles either defending further parallels between the notions, or in one case *identifying* ground with a metaphysical species of causation. The former approach is found, for example, in Schaffer (2016), who has argued that grounding claims can be formalized using the structural equation models initially developed to formalize causal claims. In a similar vein Trogdon (2018b) has argued that both causal and grounding explanations are backed by a kind of "mechanical" explanation that appeals to the mechanisms *by which* a given causal or grounding

relation holds. The identification approach, however, has been taken by Wilson (2018), who has argued that the deep parallels between ground and causation suggest we should simply identify ground with metaphysical causation. Of course, this re-emphasis on the grounding/causation parallel has in turn generated a re-emphasis on just how *unassimilable* the notions might be—most forcefully expressed in recent work by Bernstein (2016) and Koslicki (2016) (to which I return in §5).

I turn now to briefly unpack the view that I believe alleviates this tension between ground and causation: the powers theory.

§2 **Causation as Powers Manifestation**

Powers are marked out by their connection to activities and their manifestational individuation. A power is a power *to φ*, where φ is some activity the manifestation of which is the exercise of the power. A match's flammability, an electron's power to emit photons, and so on, are paradigms of power. It is common to use "power" and "disposition" interchangeably, and I follow that usage here.

Recently, rather than giving reductive accounts of powers—for example, in terms of counterfactuals—many have instead argued that we treat powers as fundamental and use them to explain other phenomena. This project has extended from modality (Jacobs 2010; Vetter 2015), to laws of nature (Ellis 1999; Bird 2007), to properties (Shoemaker 1980; Hawthorne 2001), and most relevantly, to causation (Madden & Harré 1975; Anjum and Mumford 2011).

Although powers theories of causation diverge in the details, the essence of such theories is this: Causes are manifestations of "triggering" powers, and effects manifestations of "triggered" powers. For example, a brick shattering a window involves the brick's manifest

power to shatter windows at a requisite velocity (the cause) and the window's manifest power to be shattered when hit with an object at that velocity (the effect); one domino toppling another involves the first's manifest power to topple the second (the cause), and the second's manifest power to be toppled by the first (the effect); and so on. More simply: causation is the mutual manifestation of powers. I hereafter refer to this view simply as "PTC."

The motivations for accepting PTC are too numerous to fully elaborate here, but some examples include: the powers involved in causal events intuitively explain *why* those events obtain[11]; understanding causation in terms of powers helps to distinguish mere counterfactual dependence from genuinely causal dependence[12]; powers explain the nomic facts posited to back causal explanations[13]; among others.

Most relevant for my purposes, however, is how PTC undermines the assumptions that causation is (1) diachronic, and (2) contingent. Assumption (1) is arguably the result of the pervasive influence of Humean conceptions of causation, according to which causes and effects are entirely distinct events related by temporal priority. The contingency assumption, on the other hand, might be motivated by nomic conceptions of causation, such as those found in Tooley (1988) and Armstrong (1999), according to which causal events instantiate contingent laws of nature. Whatever the motivations, PTC provides compelling motivation to reject both (1) and (2).[14]

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[11] Anjum and Mumford (2011, p. 2).
[12] Bird (2010, p.162).
[13] Bird (2007).
[14] It's unclear whether *counterfactual* theories of causation (such as that in Lewis (1973)), as such, commit one to either (1) or (2). Insofar as sameness of natural law tends to be used as a similarity metric for determining whether a presumed effect occurs in all "closest" worlds where the presumed cause occurs, assumption (2) seems to be at play. For if causal relations were *metaphysically* necessary, then they should be *nomically* invariant. In which case, we need only check whether the presumed cause occurs *simpliciter* in a particular world to know whether the presumed effect occurs, rendering irrelevant any nomic similarity metric.

Contra (1), PTC suggests that causation, at least in cases of "immediate" temporal causation involving no intermediate stages, is best understood synchronically rather diachronically—a view that has been defended, for example, by Anjum and Mumford (2011, Ch. 5) as well as Martin (2007, p. 46). For on PTC, cause and effect are in a sense simply two aspects of a *single* event: the mutual manifestation of powers. Indeed, one might say that the manifestation of the triggering power is *token-identical to* the manifestation of the triggered power, so of course one and the same token manifestation could not be separated from *itself* in time. The manifestation of water's power to dissolve salt, for example, is token-identical to, and so perfectly coincident with, the manifestation of salt's power to be dissolved; the manifestation of fire's power to heat metal is token-identical to, and so perfectly coincident with, the manifestation of metal's power to be heated; and so on. Cause and effect are thus two aspects of a single, synchronic manifestational coin.[15] C.B. Martin summarizes this point about the mutual manifestation of powers in this way:

> The two-event cause-and-effect view is easily avoided and replaced by the view of mutual manifestation of reciprocal disposition partners, suggesting a natural contemporaneity. This is not surprising in the least because the reciprocal dispositional partnering and their mutually manifesting are identical. No time gap or spatial gap is needed—not one happening before another. It is not a matter of two events, but of one and the same event—a reciprocal dispositional partnering as a mutual manifesting. This surprising identity of what we had dimly thought of as the two-event cause and effect loses its surprise in the clear light of day (2007, p. 46)

The point can be further sharpened by considering the following question: Assuming a temporal gap exists between the manifestation of the triggering and triggered powers, in what sense is the former manifesting *at all* if the latter has yet to manifest? In what sense is an

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[15] This section focuses on temporal cases of causation, and so contrasts the diachronic (occurring at distinct times) with the synchronic (occurring at the same time(s)). However, as I argue in §5.4, *atemporal* non-diachronic causation is also possible on PTC.

electron's power to repel another electron presently manifest, for example, if there is currently no corresponding manifestation of another electron's power to be repelled? Part of what it is to *be* the former causal power is to be the sort of thing that, exactly when manifest, produces the latter manifestation.

Moreover, there are pre-theoretically intuitive cases of synchronic causation, so any adequate account should be capable of capturing them. Anjum and Mumford (2011, p. 114) mention cases involving two books propping each other up, a magnet sitting on a fridge, and an iron bar glowing at a requisite temperature. Diachronic conceptions of causation cannot capture such cases, but PTC easily can: one power can trigger another synchronically.

It should be said, however, that causation *is* often diachronic—dams breaking and rivers flooding, eating and hunger satisfaction, and so on. But it's plausible to understand all such examples as cases of *mediate* or "extended" causation, and so as constituted by a series of intermediate causal stages, all of which are either (1) stages in the unfolding of a single manifestation, (2) smaller immediate (and so synchronic) causal relations, or both. (For discussion of this issue see Anjum & Mumford (2011, Ch. 5)).

Contra (2), PTC suggests that causal relations are metaphysically necessary, rather than contingent. Specifically, it is metaphysically necessary that *if* something with a power to φ in circumstances C is in C, and there are no countervailing powers, the effect, φ, will follow.[16] For if the *natures* of powers are given by the way they canonically manifest in certain circumstances, a power could not *be* the power that it is and fail to produce that manifestation in those circumstances. That is, if there were a possible world in which a power P, the nature of which is defined as a power to φ when in C, were instantiated in C (with the absence of countervailing

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powers) yet failed to φ, this would contradict the assumption that *P is* a power to φ when in *C.*

As Madden and Harré (1975) have observed, "they [the causal relata] must behave in the

specified way in the given circumstances, or not be the things that they are" (p. 91).

Consequently, powers theorists such as Brian Ellis insist that "the causal laws specifically...are

all metaphysically necessary" (2000, p. 336).[17] Indeed, such a necessitarian view finds historical

expression in Aristotle himself, the prototypical powers theorist:

> [In the case of non-rational powers] when the agent and the patient meet in the way
> appropriate to the potency in question, the one *must* act and the other be acted on...
> (*Metaphysics*, 1048a5; emphasis added)[18]

A qualification is in order here, as well. There may be *stochastic* powers: powers that

only make it *probable* that a certain manifestation will occur in propitious circumstances. It is of

course controversial whether there are any such powers. But it is sufficient for the view defended

here that PTC explains why at least *some* causal relations are necessitating. What I call

"existential powers" are naturally included in this subset of necessitating powers, being evidently

non-stochastic. The existential power of a grounder does not merely make it probable that its

groundee exist, but necessitates it. Much like the power of a fire to heat its immediate

environment does not merely make it probable that the environment will be heated, but

necessitates it.

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[17] Such a necessitarian view seems to be a logical consequence of powers-based conceptions of natural
laws such as that defended in Bird (2007, Ch. 3).
[18] All references to the Bekker pagination of the Aristotelian texts are keyed to R. McKeon, ed., *The Basic
Works of Aristotle* (2001a & 2001b).

In contrast to the contingently related events of standard accounts, then, PTC implies that causal relations are (or can be) metaphysically necessitating, and this because the natures of the powers involved in general guarantees that the causal relation obtain in the relevant circumstances.

PTC therefore undermines our two gap-generating assumptions. First, it implies that all immediate causation is non-diachronic, and second, it implies that causal relations can hold of metaphysical necessity. Before combining the powers theory with the conception of ground as metaphysical causation, however, the following question must first be answered: Just what makes the sort of causation involved in ground characteristically *metaphysical*?

§3 Ground as Existential Causation

If ground is to be understood as a causal species, what is its differentia? We cannot rely on the descriptor "metaphysical," since this merely denotes an area of philosophical concern, rather than a truly individuating property. The most natural candidate, I propose, is the differentia "existential," given the central role that existence plays in individuating ground. If ground is that relation which holds between entities when one "transfers" or "bestows" being on another, then ground must be *existential* causation.

This claim requires unpacking. First, the relevant sort of existential causation must be understood as *complete* existential causation. That is, when some entities ground a further entity, they do not simply *initiate* its existence, but rather sustain or uphold its existence. They are fully responsible for its being. It is in this sense that grounders "completely" cause groundees to exist. Thus, the causal relation between grounded and grounder is less like the causal-existential relation between children and parents (initiating being), and more like the causal-existential

relation between water's state of liquidity and its underlying molecular state (upholding in being). The water's state of liquidity is not merely initiated by the underlying molecular state, but is continuously upheld in existence thereby.

Two further constraints must be placed on the account. First, existential causation should not be construed in narrowly temporal terms, as one thing existentially causing another "*for the duration* of its existence" (or *a* duration—more on this in a moment). This would suggest that ground can only hold between temporal entities. We should not bias the account in this way, as there are plausible cases of atemporal ground—∅ grounding {∅}, for example. Second, ground, at least on orthodox views, is a *necessitating* relation. So it cannot be a contingent matter that grounders completely cause the existence of that which they ground. They must do so of metaphysical necessity.

At this point two clarifications are in order. First, it's important to note that in temporal cases an entity's grounds need not cause it to exist for the *entire* duration of its existence. In particular, there are mereological cases in which some proper parts of a whole ground that whole for a certain temporal interval of its existence, but not for the *entire* span of its existence. For example, it's plausible that, during the life-span of an animal, a certain collection of cells grounds its existence at a certain interval, but a distinct group of cells grounds its existence at a later (or earlier) interval. Such a relation is still, however, existential-causal, even if indexed to an interval less than an entity's entire existence. If $e_1...e_n$ are to ground e, $e_1...e_n$ must existentially cause *e at some temporal interval of e's existence* (if temporal).[19]

Second, we must carefully distinguish what we might call "generic," and "specific," grounding claims, and how this bears on the question of necessitation. Sometimes we make

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[19] Thanks to an anonymous referee for bringing this issue to my attention.

grounding claims about the relation between *types* of entity (generic grounding claims); other times we make grounding claims about *instances* of those types (specific grounding claims). So, for example, we have the claim "The existence of spheres is grounded in the existence of a set of points equidistant from a center" (generic), and the claim "The existence of *this* sphere is grounded in the existence of *this* set of points equidistant from *this* center." Generic grounding claims express the fact that, necessarily, if any instance of a certain type of entity exists, then some instance of another type exists. Specific grounding claims, however, sometimes involve specific grounds, equally necessitating, that do not show up in the corresponding generic grounding claim.

So, for example, the ground of a *specific* sphere must, of course, involve the existence of a set of points equidistant from a center. But it might *also* involve something peculiar to that specific sphere. For example, it might be that a specific sphere is being maintained in its existence by a person holding two halves of a hollow sphere together, in such a way that the two halves would fall apart, and so cease to form a sphere, were that person to cease his or her holding activity. In that case, part of what grounds the existence of *this* specific sphere at *this* specific time is something that does not show up in the generic grounds for spheres.

This does not, however, threaten the necessitation of the grounding relation. For it's both the case at the generic level that, necessarily, if a set of points equidistant from a center exists, then a sphere exists, and that, necessarily, if a person holding two halves of a sphere together in such and such a way exists, then a sphere exists.

Before concluding this section, the following potential objection should be addressed: Someone might doubt that 'existential' is the right differentia for the kind of causation ground is, because it's not clear how an existential relation is implicated in *every* case of ground. For

example, while it's obvious that Socrates grounds {Socrates} in the sense that the *existence* of {Socrates} is grounded in the *existence* of Socrates, it's less clear that there is an existential relation involved in the following case of ground: the fact that Socrates is human grounds the truth of the proposition 'Socrates is human.' For while it's true that {Socrates} would not exist without Socrates, it's not obviously true that the proposition 'Socrates is human' would not exist without the fact that Socrates is human (as, say, on a Platonic conception of propositions).

While this objection seems plausible, I believe it's appeal is merely apparent. For when we think more deeply about the grounding relation between the proposition and the fact, it becomes clear that there is indeed a "hidden" existential relation. To see this, consider first that the stated relation of ground is *not* that the proposition *itself* is grounded in the fact. Rather, the relation of ground at issue is that *the truth* of the proposition is ground in the fact. But what is 'the truth of the proposition'? Plausibly, a particular instantiation of the property 'being true.' And *this*, I want to argue, *does* bear an existential relation to the fact: the fact of Socrates being human *causes the truth* of the proposition 'Socrates is human', in that it causes that particular instantiation of the property 'being true' *to exist.* Once we are clear about the relevant relata, then, the existential relation becomes apparent.

With the foregoing in mind, we can characterize ground as existential causation as follows: $e_1...e_n$ ground e iff (i) $e_1...e_n$ exist, (ii) necessarily, if $e_1...e_n$ are in circumstances propitious to the complete causing of e's existence, then $e_1...e_n$ completely cause e to exist, and (iii) $e_1...e_n$ are in such circumstances. The complete causation in (ii) should be understood as causing to exist for some duration of the groundee's existence if temporal, and causing to exist *simplicter* if atemporal. What the temporal and atemporal cases have in common is this: that it's

not possible that (1) the grounders exist in circumstances propitious to the existential causation of the groundee, but (2) the grounders are not causing the groundee to exist.[20]

Having explicated both PTC and the notion of ground as existential causation, we are now in a position to combine them in the form GPC.

§4 **Ground as Powerful Existential Causation**

If we adopt the views elaborated in §3 and §4, a syllogism emerges:

(1) Causation is powers manifestation.

(2) Ground is existential causation.

 Therefore,

(3) Ground is existential powers manifestation.

In this section I explore the theory of ground arrived at in (3). I first offer an explicit formulation of the theory, proceed to clarify its components and draw out some noteworthy implications, and finally show how it fruitfully unites causation and ground by undermining the causation-ground gap. This unifying power of the theory, I take it, provides some reason to think that it is true.

The theory, then, may be formulated as follows:

(GPC) $e_1...e_n$ ground e iff:

(i) $e_1...e_n$ exist.

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[20] There may also be mixed cases of ground involving both temporal and atemporal entities, though I see no reason they should pose a special problem for GPC.

(ii) $e_1...e_n$ have a power P to completely cause e's existence.[21]

(iii) $\Box$(P is manifest if $e_1...e_n$ are in the canonical manifestation conditions for P).

(iv) $e_1...e_n$ are in P's canonical manifestation conditions.

(i) is simply the "factive" condition that ground only relates existing entities. (ii) expresses ground's existential differentia in terms of powers: if ground involves complete existential causation, then the relevant power manifest in ground must be a power to completely cause, to "uphold" or "conserve," the grounded entity in existence (hereafter "to make exist," for short). (iii) makes explicit the modal condition that this power *must* be manifest if the entities are in conditions propitious to the power's manifestation. And, finally, (iv) states that the grounders must, in fact, be in such conditions. As will be seen shortly, just what counts as the "canonical manifestation conditions" for existential power may vary with the case in question.

Note first that GPC has the right substantive and logical profile vis-à-vis ground. Substantively, powerful existential causation is a relation of modal-existential dependence just as ground should be. Moreover, it is not a *trivial* relation of modal-existential dependence, for although it's true that (say) $\Box$(the number 1 exists if I exist), it's nevertheless *false* that the I have any to causal power to make the number 1 exist. Similarly, although it's true that $\Box$(the moon exists if the square circle exists), it's nevertheless *false* that the square circle has any power to make the moon exist (if it indeed it has any power at all). Consequently, GPC does not fall prey to Finean worries about trivial relations of ontological dependence (Fine, 1995, p. 271-272).[22]

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[21] It might be objected here that this clause reneges on the reductive powers-theoretic account of causation I have assumed, since the power is *for* a causal relation. The language of causation here, however, is merely clarificatory. More strictly, we might describe the power as something like "the power to generate," 'the power to sustain," "the power to make exist," or etc.

[22] Technically this is the *converse* of Fine's original worry. In "Ontological Dependence" (1995), Fine was concerned with trivial modal-existential relations running from grounded to ground: $\Box$(If the

Logically, furthermore, GPC generates the required strict partial order. Powerful existential causation is *transitive*, because where *x* existentially causes *y*, and *y* existentially causes *z*, it intuitively follows that *x* existentially causes *z*. The reason is that if *x* has a power to make *y* exist, which has a power to make *z* exist, it follows that *x* has an "iterated" power to make *z* exist: it does so by exercising its power to make *y* in exist.[23] Powerful existential causation is also *irreflexive*, because it is incoherent to suppose that anything completely causes *itself* to exist. Finally, powerful existential causation is *asymmetric*. This is both directly intuitive as well as a logical consequence of its transitivity and irreflexivity. If *x* existentially causes *y*, it cannot be that *y* existentially causes *x*, for then we are caught in a causal-explanatory circle.[24]

Next, some comments about the relation between powerful existential causation and more typical cases of powerful causation are in order.

The power to make something exist is a curious one. As observed in §2, typically powers have "triggers" in the form of some sort of external stimulus, as well as manifestations involving two complementary powers. For example, a hammer smashing a vase involves (1) the hammer's power to break vases, (2) the vase's complementary power to break if hit, and (3) the satisfaction of the stimulus conditions for both powers. But what, if anything, are the relevant complementary powers and stimulus conditions in the case of powerful existential causation?

dependee (grounded) exists, that which it depends on (the/a ground) exists). By contrast, the concern here is with trivial modal-existential relations running from grounds to grounded: □(If the grounds exist, the grounded exists). In either case, triviality threatens. Fine appeals to essence to overcome the first difficulty, I appeal to power to overcome the second.

[23] For discussion of iterated potentialities, see Vetter (2015, 4.6).

[24] These features further imply that entities ordered in a series by powerful existential causation constitute an *essentially ordered* series, in the sense of Aquinas and Scotus. This fact has important consequences for whether ground is well-founded, and what its foundation might be. This issue is explored in Chapters 2 and 3.

First take the issue about complementary powers. In the case of grounding, the complementary powers are simply the power of the grounder to confer existence on the grounded, and the corresponding power of the grounded to have existence conferred. The case is distinct from many other cases of complementary power pairs, however, because there could be no entity with the power to receive existence from its grounds *temporally prior* to the grounding entities' exercise of its power to bestow existence thereon. By the nature of the case, such an entity doesn't exist until given existence by its grounds. What makes this power unique, then, is that it is *essentially manifest*: there is no possibility of the grounded entity (1) existing, but (2) not having its power to receive existence from its grounds be manifest. For if the conjunction of (1) and (2) *were* possible, then the entity would be existing without its grounds, which is impossible given the metaphysically necessary dependence of grounded entities upon their grounds.[25] It might be thought, however, that the notion of an essentially manifest power is incoherent—a point I address in §5.3.

Consider next the issue about stimulus conditions. What, if anything, are the stimulus conditions for a power to make something exist, or to be made to exist? What, for example, is the stimulus condition for Plato's power to make {Plato} exist? It does not appear that grounds or groundees are stimulated in this sense—in the sense that, say, a match needs to be struck in order to manifest is flammability.

The first thing to say is that it's far from obvious that all powers *require* stimulation, and perhaps at least some existential powers are among this class. Molnar (2006, p. 85-7), for

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[25] That is, it would then be existing without *at least one* of its potential grounds. Some grounding relations, such as that between determinables and determinates, are such that the groundee can be grounded by more than one entity (redness can be grounded by crimsonness or maroonness, etc.). It is metaphysically necessary, however, that even these entities be receiving existence from *some or other* of their potential grounds.

instance, has offered the examples of a muon's power to decay into an electron, or the power of a libertarian-free agent to act (if such there be); and Cartwright (2009, p. 144) gives the example of the power of an excited atom to emit a photon. Such examples appear to show the coherence of a power manifesting without stimulation, in the sense of an extrinsic object coming along to trigger the power of a previously existing entity.[26]

Another suggestion, however, is that if a *broad* understanding of "stimulus condition" is permitted, such as a mere "state of affairs" sufficient for the exercise of a power—a state of affairs that does not necessarily involve some extrinsic entity "doing" something to the entity with the relevant power—then the following is plausible: In many cases, the stimulus condition for the grounders' power to make the groundee exist is simply *their own existence*, and the stimulus condition for the groundee's power to be made to exist is *the existence of its grounders.* Typically, all it takes for grounders to make groundees exist is their own existence, and all it takes for groundees to receive existence is the existence of their grounds. In this sense the mere ontological presence of the relevant entities constitutes the stimulus condition for the respective powers.[27]

However, whether existential causation should be thought of as requiring stimulation beyond the mere existence of the grounders may vary with the case in question. For example, where some proper parts make a whole exist, we might say there is a "configurational" stimulus condition: once the parts are in the right arrangement, they produce the whole. Or (if some form of non-reductive functionalism were true) where some brain state makes a mental state exist, we might say there is a "functional" stimulus condition: when the brain state stands in the right input-output causal relations, it produces the mental state. By contrast, in the case of an instance

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[26] Williams (2017) deploys such powers in order to explain the relation between temporal parts.
[27] This point applies to *full*, and so sufficient, grounds.

of a determinate color (say, navy) making an instance of its determinable (blue) exist, it's more plausible to say that the stimulus condition is simply the existence of the navy-instance itself.[28]

The upshot of all this is that what counts as the "canonical manifestation conditions" in (iii) is likely variable. In some cases, such as Plato's power to make {Plato} exist, the canonical manifestation condition is simply the existence of the grounds—Plato himself. In other cases, such as a collection of cells' power to make an animal exist, the canonical manifestation conditions involve something further—the cells being in the right arrangement, participating in the right activities, and so on. In either sort of case, the result is the wholesale generation and upholding of a distinct entity in being.

A final notable feature of powerful existential causation is that it appears to be necessitating *tout court*, rather than only given an "absence of countervailing powers" proviso. For it is unclear what could possibly interfere with the manifestation of existential power in paradigmatic cases.[29] There are two paradigmatic cases to consider: (1) "pure" cases, in which the mere existence of the grounds is sufficient for the exercise of their existential power, and (2) mereological cases, in which the existence of the grounds plus their being in the right configuration is sufficient for the exercise of their existential power.

Nothing could interfere in (1), for nothing but interfering with the very existence of the grounds could prevent the exercise of their existential power. Once Plato exists, nothing can stop

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[28] What we end up saying about particular cases will depend, in part, on how the grounds are individuated. In mereological cases, for example, it will depend on whether we still consider the entities serving as proper parts *as* grounders even *before* they gain their status *as* proper parts of the whole (i.e., before the relevant triggering arrangement), or whether we instead only consider them grounders once in the relevant whole-generating arrangement. In the former case, the arrangement is the triggering condition for the otherwise separate entities generating the whole; in the latter case, their mere existence *qua* that arrangement, and so *qua* proper parts, is the triggering condition. As before, I don't think much hinges on which of these approaches is taken.

[29] There are three general types of interference in the dispositions literature: Finks, masks, and antidotes. For finks, see Martin (1994); for masks and antidotes, see Bird (1998).

the existential causation of {Plato}. And, given that the existence of Plato simply *is* the canonical

manifestation condition in such a case, the conditional is preserved without proviso: □(Plato's

power to cause the existence {Plato} is manifest if Plato exists). In (2) also the possibility of

manifestational interference seems unintelligible. Given that atoms $a_1...a_n$ are in the exact

configuration propitious to the generation of a star, what could possibly prevent this generation?

It seems, again, that the only way to prevent such existential causation would be to prevent their

being in such a configuration in the first place—a configuration which simply *is* the canonical

condition under which they manifest this power. But then, once again, this preserves the

conditional without proviso: □($a_1...a_n$'s power to cause the existence of star s is manifest if $a_1...a_n$

are in configuration c). Assuming such cases are representative of grounding in general, it seems

safe to conclude that the manifestation of existential power cannot be interfered with. At least,

the burden of proof is on any who think that it could to show how this might be.

With these clarifications in mind, the stage is now set to see how GPC closes the

causation-ground gap. Recall the two contrasts motivating the gap: (1) Causation is *diachronic*,

whereas ground is *non-diachronic*, and (2) Causation is a *contingent* relation, whereas ground is

a *necessary* relation. In both cases, the powers theory of causation that GPC assumes closes the

gap.

GPC undermines (1) because powerful causation (at least of the immediate variety) is as

non-diachronic as ground is. Both cause and effect, and ground and grounded, occur

synchronically (at least when they occur in time—see §5.4). Just as a fire's manifest power to

heat metal synchronically causes the heating of the metal, so Plato's manifest power to make

{Plato} exist synchronically causes {Plato}. Ground can thus be assimilated under the genus

causation because that genus does not exclude non-diachronic species. The gap asserted in (1) is illusory.

GPC undermines (2) because powerful causal relations are as metaphysically necessary as grounding relations: it is necessary that, given the presence of the grounds in the right circumstances, the groundee exists; and it is necessary that, given the manifestation of the right triggering powers in the right circumstances (the cause), the corresponding triggered powers manifest (the effect). Just as a plant will exercise its photosynthetic power of necessity in the right circumstances (absence of countervailing powers, presence of sunlight, etc.), so a collection psychological entities will exercise their existential power to generate a social entity in the right circumstances. Ground is thus subsumable under causation because all causal relations are necessitating. And, moreover, as argued above, this necessitation requires no "absence of countervailing powers" proviso, given the impossibility of interfering with existential causation. I conclude that the modal gap is also illusory.

All of this, in my view, gives us some reason to accept GPC. Its theoretical fecundity lies in its ability to unite as genus to species what one may have thought were the disparate relations of causation and ground, and to do so in a way that respects commonly accepted formal and substantive features of ground. Of course, this in itself will be insufficient to convince many, as there are a number of objections that might be made to GPC. Although addressing all such objections is beyond the scope of this chapter, it what follows I address what I take to be some of the more pressing.

§5 **Objections**

The first two objections addressed are objections to *any* view of ground as metaphysical causation, drawn from recent work by Bernstein (2016) and Koslicki (2016). The last three bear more specifically on features unique to GPC. I'll argue that each of these either fails on its own terms, or that GPC has the resources necessary counter it.

5.1 *Too Different*

Bernstein (2016) has argued that paradigmatic features of ground and causation are simply too different to be assimilated. Causation is (or at least can be) diachronic, whereas ground is necessarily synchronic; ground is a determinable with several determinates, causation is not; causation can be indeterministic, ground cannot be; and so on. Thus, superficial similarities notwithstanding, ground and causation cannot be assimilated.

In reply, I first note that many of Bernstein's contrasts are either far from self-evident, or fail to apply to GPC. For example, consider Bernstein's claim that ground is a determinable with various determinates (grounding *by composition*, grounding *by realization*, etc.), whereas causation is not. This claim can be shown to be false on Bernstein's own assumptions, for she herself appeals to (for example) causation *by omission* and causation *by commission*, *deterministic* causation and *indeterministic* causation, and so on. So this cannot serve as a basis for contrasting ground and causation. Or consider the diachronicity/synchronicity contrast. This contrast cannot be sustained on GPC, for on its assumed powers theory of causation *all* (immediate) causation is synchronic.

Particular examples aside, however, consideration of Bernstein's argument brings to light a more general methodological problem: Drawing contrasts between a pair of concepts A and B, if successful, shows only that A and B are not *identical.* But of course, the claim that ground is

metaphysical causation is *not* the claim that causation and ground are identical. Rather, it is the claim that ground is a *species* (kind, determinate, etc.) of causation. And this claim is perfectly consistent with Bernstein's contrasts. For example, it may be true that causation is potentially indeterministic, whereas ground is always deterministic. But this is easily explained if ground is a deterministic species of the genus causation—a genus which also subsumes some indeterministic species. Or consider Bernstein's claim that causation might be reflexive, whereas ground cannot be. Again, this is perfectly consistent with the claim ground is an irreflexive species of a genus, causation, that includes some reflexive species as well. I conclude that both Bernstein's specific examples, as well as her general approach, fail to undermine GPC.

5.2 *Different Counterfactual Implications*

Koslicki (2016) has forwarded an argument against Schaffer's (2016) claim that ground and causation can both be formalized using structural equation models. Her argument, however, can be formulated in a way that applies to any view of ground as metaphysical causation. It runs as follows. Consider two paradigmatic cases of causation and ground. The causal case: a brick is thrown against a window and shatters it. The grounding case: a shirt's redness is grounded in its crimsonness. Koslicki observes that there is a *counterfactual* difference between these cases. The causal case entails the counterfactual "Had the brick not been thrown, the window would not have shattered." The window shattering (the effect) is counterfactually dependent on the brick-throwing (the cause). Contrast this with the grounding case, where the parallel counterfactual "Had the shirt not been crimson, the shirt would not have been red" is *not* entailed, because there's more than one way for a shirt to be red (its redness may have been grounded in its maroonness, for example). The shirt's redness (the groundee) is thus *not* counterfactually

dependent on the shirt's crimsonness (the grounder). Koslicki concludes there is a crucial counterfactual difference between ground and causation.

Of course, Koslicki recognizes that the causal case *could* parallel the grounding case if it were a case of preemption, where some other brick-throwing would have shattered the window had the actual brick-throwing failed to. For in that case, just as the shirt's redness could equally have been grounded in its maroonness, so the window shattering could equally have been caused by this alternative brick-throwing, and so in neither case would the counterfactual dependence hold. However, Koslicki argues that this only furthers her point: the only counterfactual parallel there is between ground and causation is that an *abnormal* preemptive case of causation parallels a *normal* case of ground. But when we compare normal cases, According to Koslicki, the counterfactual distinction remains.

The problem with this objection is that Koslicki's examples are not representative either of ground in general or of causation in general, and recognizing this suggests that a focus on counterfactuals is misguided. Consider first the determinable/determinate grounding case. The same determinable can of course be instantiated by way of various determinates. Consequently, that a particular determinable is instantiated is not (or at least not always—more on this below) counterfactually dependent on any particular of its determinates being instantiated: a shirt may be red because crimson, or red because maroon; a particle may be charged because negatively charged, or charged because positively charged; and so on. But to see that the determinable/determinate case is not representative, consider a different case: Plato grounding {Plato}. Because sets have their members essentially, {Plato} could not possibly be grounded in any other way but by Plato. It follows that had Plato not existed, {Plato} would not have existed. But then this constitutes a perfect parallel with "normal" cases of causation: Just as the effect is

counterfactually dependent on the cause, so the groundee (the set) is counterfactually dependent on the grounder (the member(s)). So Koslicki's determinable/determinate case is not representative of ground in general.

Consider next Koslicki's non-preemptive case of causation. It is claimed that such cases constitute "normal" cases of causation, and so it is to them that we must turn to discern counterfactual distinctions between causation and ground. But just what does this notion of "normalcy" amount to, and why it should be relevant? After all, given that causation *can* involve preemption, isn't it an entirely contingent fact about our world (if indeed it is a fact at all) that causation tends not to involve preemption? Imagine a possible world where massive causal preemption was the norm. Indeed, we might even imagine it is a *law* at this world that for each fundamental particle p that causes a change M by ϕ-ing, there exists some distinct fundamental particle p^* ready to cause M by ϕ-ing if p does not, thus rendering the counterfactual (for each fundamental particle) "Had p not ϕ'd, M would not have occurred" false. If this is possible, and it thus is entirely contingent that causation tends not to be preemptive and so supports such counterfactuals, why should Koslicki's distinction between contingently "abnormal" cases of causation and "normal" cases of ground be relevant vis-à-vis an *essential* difference between the notions? After all, in the world just imagined, normal cases of causation *would* coincide with what according to Koslicki are normal cases of ground.

I conclude that Koslicki's objection is an artifact of non-representative examples. On the one hand, there are cases of ground that *do* imply counterfactuals paralleling normal non-preemptive cases of causation, such as sets and their members. On the other hand, there are cases of causation that *don't* imply such counterfactuals, namely all preemptive cases (which themselves counterfactually parallel determinable-determinate grounding cases). Thus, a

difference in counterfactual implications cannot be used to drive a wedge between causation and ground. Some cases of causation imply counterfactuals of the form "Had *p* not been the case, *q* would not have been the case," some don't; some cases of ground imply counterfactuals of the same form, some don't.

5.3 *No Necessary Manifestation*

Powers, one might argue, must be *possibly unmanifest*, and this due to their "non-categorical" nature. Thus, insofar as GPC implies that there are at least some *necessarily manifest* powers (in the sense that, *when possessed* by the relevant objects, they are necessarily manifest by those objects), it conflicts with the very *concept* of power. Such is the case with all existential powers that require only the existence of their possessor in order to manifest—an instance of purple manifesting its power to produce an instance of color, for example.

There are two problems with this objection. First, it assumes a contestable view of the distinction between categorical and powerful properties. Second, there are independent empirical and theoretical motivations for accepting necessarily manifest powers.

Alexander Bird, like me, countenances necessarily manifest powers, for "a genuine disposition might permanently manifest itself, perhaps even necessarily so, without that making it categorical" (2007, p. 66). In light of this, he suggests drawing the categorical/non-categorical distinction in terms of whether a property has *necessary connections* to other entities. This is intuitive, as an object's shape or location (paradigms of categoricity) seem not to implicate other objects, whereas its flammability or negative charge (paradigms of power) *do* seem to implicate other objects: Negative charge is a power *to repel other negatively charged objects*; flammability is a power *to be set aflame by another object.* I concur with Bird here, but would add that the

powers of an object necessarily connect it to others because they enable it to *affect* or *be affected by* other objects. Negative charge enables an object to affect similarly charged objects by repelling them; flammability enables an object to be affected by other objects which can ignite them.

By this criterion of non-categoricity, necessarily manifest existential powers surely count. For the power of grounders to bestow existence is affective *par excellence*. Indeed, there is no stronger way in which an object *could* affect another but by generating its very being. Similarly, the power of groundees to receive existence is the strongest way in which an object could *be affected* by another. The fact that such powers are necessarily manifest is irrelevant on this way of drawing the distinction.

The affective nature of powers is related to another way of drawing the categorical/non-categorical distinction: powers are essentially *intentional*, whereas categorical properties are not. As Molnar (2006) put it, "Powers, or dispositions, are properties *for* some behavior...These properties have an object towards which they are oriented or directed" (p. 60). On this criterion necessarily manifest existential powers also count as non-categorical, as they are powers *to causally sustain* another object's existence. They are inherently "directed at" this ontological conservation. On either the "necessary connection/affective" criterion or the "intentionality" criterion, then, necessarily manifest powers count as non-categorical.

Moreover, there are plausible empirical cases of necessarily manifest powers. Molnar (2006, p. 87), Cartwright (2009, p. 145), and McKitrick (2013, p. 135) have all offered the example of the gravitational force exerted by a massive object as a necessarily manifest power.[30]

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[30] Strictly speaking Cartwright (2009, p. 152) draws a distinction between a power's 'exercise' and its 'manifestation.' Thus a massive object continuously 'exercises' its capacity in that it is necessarily exerting force, but does not necessarily 'manifest' it because countervailing forces may prevent it from

And Vetter (2014) has suggested a series of examples including "an animal's disposition to metabolize, the disposition of fire to spread heat, and the...disposition of objects with electric charge to emit forces that stand in a particular correlation to the charges and distances of objects around it" (p. 90). To possess such powers at all is to manifest them. These constitute empirical counterexamples to the idea that powers must be potentially unmanifest.

Finally, necessarily manifest powers are well-motivated theoretically. McKitrick (2013), for example, has argued that such powers are required for pandispositionalists to avoid an infinite regress of power activation. Roughly, if a triggering power must be activated by another triggering power, which itself must be activated by a further triggering power, and so on, then we have a vicious regress unless we eventually stop at some trigger-less and necessarily active power that triggers all the others. Further, Vetter (2015) has argued that necessarilly manifest dispositions (or as she puts it "maximal potentialities") have theoretical utility as the limiting case of degrees of dispositions. Things can be more or less disposed to ϕ, and to have the maximum potentiality to ϕ is to ϕ Necessarily. Necessarily manifest existential powers can in this light be viewed as maximal potentialities to make further entities exist.

I conclude that Necessarily manifest powers are both conceptually coherent as well as empirically and theoretically motivated.

5.4 *No Atemporal Causation*

In this chapter thus far, I have sometimes referred to grounding as "synchronic," and at others as "non-diachronic," depending on the context. A relation is synchronic just in case it

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actually moving nearby objects. I do not think this subtle distinction, however, has much bearing on the general point made here.

obtains between entities *at the same time(s).* A relation is non-diachronic just in case it *does not obtain between entities at distinct times*. The synchronic is thus a proper subset of the non-diachronic. A relation might be non-diachronic but *not* synchronic if it does not obtain between entities separated in time because it does not obtain between entities at *any* time(s). Thus, strictly atemporal relations count as non-diachronic but not as synchronic.

With this distinction in mind, it might be argued that even if causation can be synchronically non-diachronic, it nevertheless cannot be *atemporally* non-diachronic. Causation must occur at *some* time, even if not *across* time. GPC is therefore false, as there are plausible cases of atemporal grounding: 3 grounding {3}, the platonic property *being purple* grounding the platonic property *being purple or yellow*, and so on.

I reply that once a conception of causation according to which causation always involves a sequence of events is abandoned, as it is on PTC, the underlying motivations for barring atemporal causation should also be abandoned. Those underlying motivations are, I suspect, (1) the "temporal priority" intuition, and (2) the "event-involving" intuition.

The temporal priority intuition is that if A causes B, A must come *before* B, and B *after* A. The Humean "constant conjunction" picture of causation that has so formed the modern philosophical imagination may underlie such an intuition. On this empiricist picture, causation is thought of as one thing happening, and then another, in regular sequence. It follows *a fortiori* from this sequentialist picture that causation must occur in time, because it must involve a before and after. But note crucially that it is not time *per se* that is here essential for causation. Instead, it is time *qua* its ability to order events into before-and-after relations that is essential. But then if time's sequential ordering capacity is the driving force behind the ban on atemporal causation, it simply does not apply to PTC. For on that theory, causation is *not* essentially ordered into

before-and-after relations, but instead (at least in cases of immediate causation) ordered merely into explanatory "trigger" and "triggered" relations involving no before and after.

A second motivating intuition, however, may be that causation is essentially *event-involving*. Causation is always a "happening," "occurrence," or "process." And because events are essentially temporally located—something like an object instantiating a property at a time—causation must also be temporally located. Again we have an argument motivated not by time's *per se* relation to causation, but by its relation to something else thought essential to causation—namely, events. Causation essentially involves events, events are essentially temporal, so causation is essentially temporal.

I reply that the motivation for thinking causation must involve events *at all* is lost once the idea that causation must hold between *distinct* events is abandoned, as it is on PTC. For on PTC that a case of causation occurs at a time is no part of what makes it a case of causation, as it is on theories that insist temporal priority relations are partly constitutive of causation. Instead, it is simply the presence of a triggering power and a triggered power producing a mutual manifestation that constitute it as a case of causation. That the powers mutually manifest *at a time* does nothing to constitute the state of affairs *as* causal.

But if neither of the underlying motivations for rejecting atemporal causation apply to the powers theory assumed by GPC, then it forces the question: Why should causation *not* be possible between atemporal entities? As long as it's coherent to describe (say) the number 7 as having the power to make {7} exist, what principled reason is there to bar the idea that 7 *causes* {7} to exist by this power, and does so timelessly? Nothing appears incoherent about such timelessly manifest powers once the temporal priority and event-involving assumptions are dropped.

5.5 *Wrong Relata*

Ground is a relation that holds among entities of various ontological categories, including abstracta such as properties, propositions, and numbers. By contrast, it might be argued, causal relations hold only between concreta. GPC is therefore false because it entails that causal relations hold between entities of the wrong kind.

At least two replies are available to this objection. First, it might be that the intuition behind the causal inefficacy of abstracta is really about their *spatio-temporal* inefficacy. That is, abstracta play no causal role in the unfolding of spatio-temporal events. However, this is perfectly consistent with abstracta bearing causal relations to *other non-spatio-temporal entities*. It is thus worth interrogating whether widespread intuitions about the causal inefficacy of abstracta are really about causation *per se*, or instead about their specifically spatio-temporal inefficacy. Perhaps the number 7 has never caused nor could cause any change in space-time, but nevertheless eternally causes the set {7}.

Second, we might directly challenge the assumption that abstracta must be causally effete. Perhaps the number 9 makes a causal contribution to my arriving at the correct mental sum 9+3=12. Perhaps the proposition "The stove is still on" causally contributes to my turning off the stove, being an essential component of the intentional states "Believing that the stove is still on" and "Desiring to make it not the case that the stove is still on," the joint possession of which causes me to turn off the stove. Indeed, the notion that abstracta might be causally efficacious has been given compelling defense by Callard (2007), as well as Brock, Maslen, and

Ngai (2013, p. 72-80), the latter arguing that the inefficacy of abstracta is an unmotivated

"dogma."[31] Suffice it to say that it is at least not self-evident that abstracta are causally effete.

There are thus no decisive objections to GPC. Objections to the general notion of

metaphysical causation, as well objections bearing specifically on GPC, either fail on their own

terms or fail to apply to GPC.

§6 **Conclusion**

In this first chapter, I have defended the view that ground is powerful, existential

causation, a view with the theoretical virtue of unifying as genus-to-species what many have

thought are entirely distinct relations. The failure to see the possibility of this unification,

moreover, has arguably been a symptom of the pervasive influence of Humean conceptions of

causation. When a powers theory of causation is embraced, however, this unification becomes

perfectly natural. Consequently, powers theorists open to the idea that ground might be a kind of

causation have every reason to accept GPC. On the other hand, those who are neither powers

theorists nor sympathetic to a causal view of ground now have reason to reconsider: the

theoretical fecundity of GPC provides motivation for adopting its constituent theories.

GPC thus extends the promising research program of powers ontology to a new area. If

powers have fruitfully illuminated phenomena as wide-ranging as modality, properties, and

causation, why not apply them to ground?

In the following chapters, I will address two further questions about GPC. First, is there

any precedent in the history of philosophy for accepting such a relation of powerful, existential

causation? And second, does the view have any substantive metaphysical implications, beyond

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[31] Brock et. al. specifically defend the possibility of abstract *fictional* objects entering into causal
relations, but many of their points generalize.

theoretical unification? I answer both in the affirmative. In Chapter 2, I argue that the concept of powerful, existential causation was pervasive in the medieval tradition, and bore much metaphysical fruit. This shows that, far from being a voice crying in the wilderness, the project of this thesis is in fact carrying on a rich tradition of metaphysical thought. In Chapter 3, drawing on these medieval insights, I will argue that GPC, unlike any other conception of ground, has the resources necessary to show that, *contra* infinitists and in vindication of foundationalists, there must be some fundamental ground of being. GPC indeed has profound metaphysical implications.

Chapter 2:
Existential Causation and Essential Order in The Medieval Tradition

In the previous chapter, I defended a view according to which ground is to be identified with powerful, existential causation. In this chapter, I situate that view in the history of philosophy. I intend to show, in particular, (1) that there is precedent for such a view in the medieval tradition of thinking about efficient causation, and (2) how this view of causation was deployed to argue for a first cause, or fundamental ground, of being.[32]

There are two reasons tracing this history is important for the project of this thesis. First, it shows that widely held intuitions that causation *must* be distinct from ground are historically idiosyncratic, reflecting not objective judgments about "the" concept of causation, but rather theory-laden judgments that would have been foreign to many of our philosophical forebears. Recognition of this fact will hopefully contribute to further removing unnecessary obstacles to accepting this more unified picture of ground and causation. Second, this history shows why adopting such a view of ground is *consequential*, and thus amounts to more than a merely semantic or pragmatic difference with dominant *sui generis* views of ground. Specifically, the role played by existential causal powers in medieval cosmological arguments will suggest a way of formulating what are, in our contemporary context, novel arguments for grounding foundationalism. It is these arguments that I will develop in the third and final chapter.

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[32] All of the medieval Aristotelians discussed in this chapter accepted Aristotle's fourfold division of causes: final, material, formal, and efficient. Unless otherwise noted, all references to causation in this chapter are to efficient causation, both in the body as well as in quotations.

Finally, there is something of autobiography involved in exploring this history. For it was my own encounter with this medieval tradition of thinking about causation that ultimately inspired me to formulate and defend the view offered in Chapter 1.

§1. **Existential Causation in the Medieval Tradition**

Several of the most influential medieval philosophers held to views of causation according to which it is powerful, necessitating, synchronic, and, in some cases, existential. That is, they held to views of causation that possessed all of the main features I ascribe to ground in Chapter 1. For such thinkers, the existence of contingent beings is conserved from moment to moment by a chain of existential causes, terminating ultimately in God's ongoing creative act of sustaining the entire contingent order. It was therefore common to view God's creation and conservation of contingent existence itself as a veritable *paradigm* of efficient causation—a paradigm markedly different from the post-Humean paradigm of alteration over time.[33] In what follows, I explore this earlier conception of causation as it found expression in the thought of Avicenna (Ibn Sīnā), Thomas Aquinas, John Duns Scotus, and Francisco Suárez. From their thought emerges a picture of causation that, while not in every respect identical to, nevertheless clearly anticipates, the causal conception of ground defended in Chapter 1.

1.1 **Avicenna**

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[33] For most of the medieval scholastic tradition, God's act of creation and His act of conservation were not viewed as fundamentally distinct: God creates the cosmos out of nothing as much now as he did at its first moment. So, for example, according to Aquinas in his *Summa* (1952), "The preservation of things by God is a continuation of that action by which He gives existence, which action is without either motion or time; so also the light in the air is by the continual influence of the sun" (*ST* 1.104.1 ad 4).

Avicenna, who represents a kind of synthesis of Neoplatonic and Aristotelian thought, inherited the Aristotelian notion that causation involves the actualization of a power. Indeed, often, and in many contexts, Avicenna uses the language of "powers" and "propensities" to describe the causal structure of the world. In explicating natural motion in his *Physics of the Healing*, for example, Avicenna writes that "[w]e set it down as a posit, which the natural philosopher accepts and the metaphysician demonstrates, that the bodies undergoing...motions are moved *only as a result of powers in them* that are principles of their motions and actions" (2009, p. 39; emphasis added). Similarly, discussing different kinds of causal agency, he comments,

> Simple [agency] involves the action's arising out of a single active power (as, for example, pushing and pulling in bodily powers), whereas compound [agency] is that the act arises from a number of powers, whether agreeing in species (like many men who move a ship) or differing in species (like hunger resulting from the faculty of desire and sensation)... (Ibid., p. 76)

Avicenna also, in his *Metaphysics of the Healing*, deploys the notion of powers to unpack the distinction between voluntary and involuntary action, as well as the concepts of art and habit (2005, p. 194-205).

That Avicenna additionally thought of causation as necessitating is equally clear throughout his work. He insists that "[o]nce a thing is complete as an actual cause, its effect is made necessary" (2014, p. 138), and goes on to write that "if such a state [where the conditions for the cause to act are all in place] exists, whether as a nature, as a decisive volition, or as something else, the existence of the effect is made necessary. If, on the other hand, such a state does not exist, the nonexistence of the effect is made necessary" (Ibid.). Scholars of Avicenna have also noted this feature of his thought. Richardson (2014), for example, writes that "Ibn

Sina's metaphysical discussions of causality tend to emphasize that causes necessitate their effects. He argues that the existence of anything possible in itself is due to an external cause; this cause renders what is possible of existence in itself necessary of existence through another" (p. 113). Marmura (1984) confirms this reading, commenting that "For Avicenna, the essential, proximate cause in the realm of nature (when all causal conditions, including the absence of impediments, are fulfilled) 'necessitates its effect and coexists with it'" (p. 176).

Moreover, Avicenna clearly and forcefully argued that causation can be existential. Indeed, for Avicenna *all* causation was, at bottom, what we would now think of as the "metaphysical" causation involved in ground or ontological dependence. It is here that Avicenna decisively broke from the narrow Aristotelian definition of the efficient cause as a mere source of change or motion to an expanded definition of the efficient cause as a source of *being* itself. Avicenna unpacks existential causation in his *Metaphysics* as follows:

> By agent [we mean] the cause which bestows an existence that is other than itself...This is because the metaphysical philosophers do not mean by 'agent' only the principle of motion, as the naturalists mean, but the principle and giver of existence, as in the case of God with respect to the world. As for the natural efficient cause, it does not bestow any existence other than motion in one of the forms of motion. Thus, in the natural sciences, that which bestows existence is a principle of motion. (2005, p. 194-195)

Richardson helpfully summarizes this view of Avicenna's, writing that "[Avicenna's] definition of the efficient cause as a giver of existence encompasses God's creative acts, as well as the acts of natural efficient causes. Both are said to give existence to another; the latter are said to give existence only in one of the forms of motion. In this way, Ibn Sina supports his view that creators and principles of motion in another are causes of the same type" (2014, p. 108). An efficient cause, therefore, "...bestows from itself an existence upon another thing, which this latter did not

possess" (2005, p. 196), and so it belongs to the effect "in itself to be nonexistent and [then] to be, by its cause, existing" (Ibid., p. 203). And again,

> ...what [an effect] has essentially from the agent is existence; [also,] the existence it [now] possesses is due only to [the fact] that the other thing [that causes it] is of a sort from which there must ensue an existence for another, derived from its [own] existence, which belongs to it essentially. (Ibid., p. 197).

It is clear, then, that the notion of existential causation was fundamental to Avicenna's thought.

Finally, causal simultaneity logically *follows* from this existential conception of the efficient cause. For if there were any moment at which the true efficient cause of a thing, which according to Avicenna is a giver and conserver of that thing's existence, ceased to be present with it, the effect would of course cease to be. As a consequence, "the effect needs that which bestows existence on it always, permanently, as long as [the effect] exists" (Ibid., p. 200). It may *seem* as if cause and effect can be separated in time, but according to Avicenna we are misled into thinking this by misidentifying what the proper, or "essential," efficient cause of the relevant thing is, as that which bestows being upon it. He writes,

> The cause of [the error] of the one who thinks that the son [as the effect] continues to exist [independently of a cause] after the father [as the cause], that the building continues to exist after the builder [has built it], and that the warmth continues to exist after the fire [is removed] is a confusion resulting from the ignorance of the true nature of the cause. For the builder, the father, and the fire are not, in reality, causes for the *subsistence* [emphasis mine] of these effects. For the builder, the one mentioned as the maker [of the building], is neither the cause for the subsistence of the mentioned building nor, moreover, of its existence. (Ibid., p. 201)

That is, in the case of the builder and the house, although the builder is the proper cause of the existence of motions that eventually *terminate* in the house, he is not the proper cause of the existence of the house *itself*. The causes of *this* are the simultaneously existing materials that

constitute the building (the bricks, mortar, etc.). Avicenna thus insists that "In reality, a thing cannot be such that it is rightly a cause of [another] thing unless [that other] thing coexists with it. If a condition of its being a cause is its very self, then, as long as its [very] self exists, it is a ground and cause for the second's existence" (Ibid., p. 126). It is striking in these and many other passages of Avicenna just how close, if not identical, his discussion of existential causation is to the contemporary discussions of grounding.

Of course, Avicenna acknowledges the reality of causal chains extended in time. The builder, for example, is surely part of the house's causal *history*. However, he is careful to distinguish between what he terms "accidental" or "preparatory" causes from *essential* causes. The essential cause is that which preserves the thing in its ongoing existence, or explains its existence *tout court*, rather than that which merely aids in its initial production. He writes,

> Since this has been settled, then, if something by virtue of its essence is a cause for the existence of something else that is permanent, then it is its permanent cause as long as its essence exists. If [the cause] exists permanently, then its effect exists permanently. Such a thing among causes would then have the higher claim to causality because it prevents the absolute nonexistence of the thing. It is the one that gives complete existence to the thing. This, then, is the meaning that, for the philosophers, is termed "creation." It is the giving of existence to a thing after absolute nonexistence. For it belongs to the effect in itself to be nonexistent and [then] to be, by its cause, existing...Hence, every effect constitutes an existence after nonexistence, in terms of essential posteriority (Ibid., p. 203).

Avicenna summarizes this view of simultaneous, essential causes as follows:

> Thus, the true causes coexist with the effect. As for those that are [temporally] prior, these are causes, either accidentally or as helpers. For this reason, it must be believed that the cause of the building's shape is combination, the cause of [the latter] being the natures of the things being combined and their remaining in the way they are composed, the cause of [these natures] being the separable cause that enacts the natures. The cause of the son is the combination of his form with matter through the cause that endows forms. The cause of the fire is the cause that bestows forms and the total ceasing of the

complete disposition opposed to those forms, both together. We thus find that causes coexist with their effects. (Ibid. p. 202)

It seems safe to conclude that Avicenna thus held to a view of causation strikingly similar to GPC. For according to him, genuine, "essential" causation occurs when a set of entities, with requisite powers or propensities, cause the very existence of a thing, and do so synchronically and necessarily.

1.2 **Aquinas**

Aquinas, the Latin Aristotelian *par excellence*, also thought of causation in terms of the actualization of power. In his view, "...the action of a thing, even when it is acting as an instrument, must arise from that thing's power" (2011, p. 30), and "...in effects there is something that is due to the power of their principal agents, and which cannot be due to the power of the instrument, and it is this that takes the principal place in the effect.." (Ibid., p. 566). Aquinas' analysis of motion, or change, follows suit: "...motion is nothing else than the reduction of something from potency to act. But nothing can be reduced from potency to act except by something in a state of act. Thus that which is actually hot, as fire, makes wood, which is potentially hot, to be actually hot, and thereby moves and changes it" (*ST* 1.2.3 resp).[34] Indeed, modern commentators have observed that Aquinas' conception of causation is naturally classified with contemporary powers-theoretic, or "dispositionalist," accounts of causation. As Michael Rota (2012) observes, "because of his focus on powers and inclinations, Aquinas's understanding of causation has most in common with contemporary dispositionalist accounts of causation, which take causal powers as irreducible aspects of reality" (p. 111).

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[34] All quotations of the *Summa Theologica* are drawn either from Aquinas (2017) or Aquinas (1952).

That causation is a necessitation relation is not as prominent a theme in Aquinas as it is in Avicenna. However, I think it a reasonable inference that Aquinas accepted as unobjectionable the Aristotelian doctrine that (at least with respect to natural, "non-rational" powers) "when the agent and the patient meet in the way appropriate to the potency in question, the one must act and the other be acted on" (*Metaphysics*, 1048a5). Indeed, in his commentary on Aristotle's *Metaphysics*, Aquinas registers no objection or revision to this doctrine, simply re-stating it and adding what he takes to be a clear example of his own:

> [Aristotle] says that in the case of irrational potencies when the thing capable of being acted upon comes close to the thing which is capable of acting, then in accordance with that disposition whereby that able to be acted upon can be acted upon and that capable of acting can act, it is necessary that the one be acted upon and that the other act. This is clear, for instance, when something combustible comes in contact with fire. (1995, p. 600)

However, it is important to note that, just as contemporary powers theorists often insist, this claim of necessity for Aquinas required a proviso: that there be no countervailing, or "impeding" powers present. He writes,

> It should be said that not every cause brings about its effect with necessity, even if it is an efficient cause, because a cause can be impeded so that sometimes its effect does not follow. For example, natural causes, which do not produce their effects with necessity but only for the most part, because they can sometimes be impeded." (1998a, p. 562)

It might be argued that this passage indicates Aquinas' clear *disagreement* with causal necessitation. However, it seems clear given the context that he would be happy to accept the necessity of causation given a "no countervailing powers" proviso. Suffice it to say that it seems

probable that Aquinas believed (at least for the case of non-rational powers) in causal

necessitation in the sense relevant to GPC.[35]

Undoubtedly influenced by Avicenna, Aquinas additionally conceived of at least *some*

efficient causes as existential. The Angelic Doctor gave a three-fold classification of efficient

causes: causes of motion, conservational causes, and causes of being. The kind of efficient

causation involved in giving and conserving being find ultimate expression in God's ongoing

creative activity. Joseph Owens summarizes this aspect of Aquinas's thought when he writes,

> Being cannot come from the creature's own nature, for without existence there would be
> no creature to produce it. It has to come from something else: from the primary efficient
> cause. In the creation proclaimed by Genesis, moreover, there was nothing antecedent to
> receive the existence. There was only the giving of being...This is a radical development
> of the Aristotelian notion of efficient causality. It continues to recognize the Aristotelian
> form as cause of being, but only under the activity of an efficient cause. It makes efficient
> causality antecedent to all finite form, so that finite form is brought into being by reason
> of the existential actuality it limits and specifies. Efficient causality now bears upon the
> whole of the finite thing and extends to the production of both matter and form through a
> creative act—the bringing of something into existence rather than the initiating of
> motion. In Aristotle matter was related to form as potentiality to actuality, but now the
> whole finite thing is seen as itself a potentiality to its own existence. (1993, p. 47)

Aquinas unpacks his notion of the conservational efficient cause in the *Summa* as follows:

> ...a thing is said to preserve another *per se* and directly, namely, when what is preserved
> depends on the preserver in such a way that it cannot exist without it. In this manner all
> creatures need to be preserved by God. For the being of every creature depends on God,
> so that not for a moment could it subsist, but would fall into nothingness were it not kept
> in being by the operation of the Divine power... (1.104.1 resp)

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[35] The following passage may provide additional textual support for Aquinas' acceptance of causal
necessitation: "It should be noted that there are two kinds of necessity: absolute and conditional. Absolute
necessity arises from causes prior in the way generation, namely matter and the agent, just as the
necessity of death comes from matter's disposition to join with contraries." (1998b, p. 26)

Part of Aquinas' insistence that the existence of each finite thing requires an ongoing efficient cause derived from a metaphysical distinction that he inherited from Avicenna: that between essence and existence. For both philosophers, finite substances are composed not only of matter and form, as Aristotle had taught, but more fundamentally of essence and existence. A thing's essence determining *what* it is, and its existence *that* it is. Because of this real distinction between, and composition of, essence and existence in finite beings, Aquinas infers that there must be some *causal explanation* for why existence is conjoined to this or that essence. He discusses this issue most extensively in his important early work, *On Being and Essence*. There he writes,

> Whatever belongs to a thing is either caused by the principles of its nature, for example, risible in man; or comes to it from some extrinsic principle, as light to air from the influence of the sun. Existence cannot be caused by the form or quiddity of a thing—I mean as an efficient cause—because in this way a thing would be a cause of itself and produce itself in existence, which is impossible. Therefore it is necessary that each thing whose existence is other than its nature has its existence from another. (1998c, p. 42-43)

That is, according to Aquinas, if existence is not part of the very nature or essence of a particular substance, then its existence must be caused by something extrinsic to it. Therefore, all finite beings, whose nature is *not* existence—as it is for God—must be receiving their existence, as from an efficient cause, extrinsically from moment to moment. Aquinas, then, not only accepted that there are existential forms of causation, but positively argued for such a thesis.

The Dumb Ox moreover held that "...a perfect cause and its effect exist simultaneously" (1998d, p. 714). That is, the proximate cause of anything's being, whether it be a motion, an accident, or an entire substance, must be simultaneous with its effect. In *On the Principles of Nature*, for example, Aquinas states, "...it should be noted that, as regards actual causes, the

cause and the caused must exist simultaneously, so that if the one is, the other is: for if one is an actual builder, it is necessary that one build, and if actual building takes place, there must be an actual builder" (1998b, p. 28). As Thomas Gilby (1964) observes, "St. Thomas does not treat causation [in the efficient, metaphysical sense] as a number of successive changes strung together, but as the co-presence of effect and cause in one proceeding..." (p. 199). St. Thomas says of Divine creation, for example,

> ...God causes this effect [created being] in things not only when they first begin to be, but as long as they are preserved in being; as for instance light is caused in the air by the sun as long as the air remains illuminated. (*ST* 1.8.1 resp)

We can conclude that Aquinas held that the four key tenets of GPC apply to natural causes. Indeed, as Cohoe (2013) has noted, "Aquinas's account of causality is...closer to contemporary theories of ontological dependence than it is to the predominant contemporary theories of causality" (p. 839).

1.3 **Duns Scotus**

Scotus, also working within the Aristotelian tradition, accepted a powerful conception of causation. The notion of power, for example, plays a key role in Scotus' distinction between "natural" and "voluntary" causation, and between "essentially" and "accidentally" ordered causal series (both of which will be discussed shortly). As Richard Cross (1999) observes, "Scotus understands *every* cause to have causal powers, and to be (in this sense) an agent. Agency, for Scotus, applies to many more substances than we might be inclined to assume" (p. 161, emphasis in original). Just how prevalent such power-talk is in Scotus' work will come out further in Section 2.

It is in Scotus' distinction between natural and voluntary causation that his views on causal necessitation emerge. For the Subtle Doctor, precisely what distinguishes the powers of natural agents from those of voluntary, "willing" agents, is that the former, when in the requisite circumstances, act with necessity, whereas the latter do not. Following Aristotle, for example, he says that "[Natural] potency of itself is determined to act, so that so far as itself is concerned, it cannot fail to act when not impeded from without..." (2000, p. 371), and "The only source of contingent action is either the will or something accompanied by the will. Everything else acts with a natural necessity and, consequently, not contingently..." (Ibid., p. 54). This feature of Scotus' thought has been noted by various commentators, including Ingham and Dreyer (2004, p. 90), Effler (1962, p. 117, p. 164), and Cross (1999, p. 86). So, like Aquinas, it seems that at least for the class of non-rational causes, he conceived of causation as necessitating.

The Scot also, following his predecessors, believed that at least some efficient causation was existential. In his *De Primo Principio*, for example, Scotus cashes out the efficient-causal sense of existential dependence as follows:

> The prior according to nature and essence is that which is able to exist without the posterior, but not conversely. I take this in the following sense: Even if the prior necessarily causes the posterior and therefore cannot exist without it, still this is not because it needs the posterior for its own being, but conversely (1949, p. 7).

Here, Scotus is concerned with something like Aquinas' "conservational" cause: the cause of a thing's very being, required from moment to moment. As Cross observes, "Scotus—like Aristotle and all the medievals—talks about substances causing effects, where possible effects include the properties of objects *and the existence of objects*" (1999, p. 16; emphasis added). The notion of existential causation also plays a crucial role in Scotus' argument for a First Cause of being, as will be explored in the Section 2.

Finally, Scotus conceived of the proximate, or "essential" cause of a thing's existence as simultaneous with its effect. For example, he writes "...all the per se and essentially ordered causes are needed simultaneously to cause the effect; were this not so, some per se and essential causality would be lacking the effect" (1995, p. 47), and elsewhere, "...I say that the mover is by nature simultaneous with the effect, because if these correlates are *per se*, their relations are simultaneous" (1998, p. 367). Scotus' conception of the essential efficient cause, then, aligns quite well with the components of GPC.

1.4 **Suárez**

Last (though by no means least) in our line of medieval philosophers is the late scholastic Francisco Suárez. In many ways, Suárez represents the pinnacle of scholasticism, writing during the Renaissance and summing up, as well as building upon, everything that had come before. It is no surprise, then, that Suárez adopted, in broad outline, the notion of existential causation that had been elaborated and defended by his scholastic forebears.

The references to causal power in Suárez are ubiquitous. He states straightforwardly that "an action must presuppose a sufficient power" (1994, p. 271). Contrasting instrumental and primary causation, he writes "...an instrument does not act unless it is moved; that is, it does not act except in the power of a prior agent" (Ibid., p. 7), and similarly, "...a principal cause will be a cause which through a principal power—that is, a power that is more noble than, or at least as noble as, the effect—influences the action whereby such an effect is produced" (Ibid., p. 30). And, commenting on the causal relation between a natural phenomenon and our sensory perception thereof, Suárez argues that "light is visible because it is of such a nature according to which it has the power to change a [sensory] potency in a certain way..." (2006, p. 199).

Following his fellow Aristotelian scholastics, Suárez also distinguished rational from natural potencies, insisting on the latter's necessity in the strongest possible terms. The following is just a small sampling of such statements:

>...among created causes there are many that operate necessarily once all the things they require for operating are present...This is obvious from experience and from a simple induction. For the sun illuminates necessarily, and fire produces warmth necessarily, and so on for the others. The reason for this must stem from the intrinsic condition and determination of [the agent's] nature... (1994, p. 270).

>...all causes that operate without the use of reason operate as such with the aforementioned necessity (Ibid., p. 280).

>...every faculty which altogether lacks the use of reason exercises its operations by natural necessity (Ibid., p. 280).

>...one can infer from this that the necessity in question is so strong that neither the intrinsic power of the faculty itself nor any other natural cause whatsoever is able to remove it or to prevent it from issuing in an act. To be sure, natural causes can, as we have explained, impede one another through resistance or through a contrary action, and in this way they are also capable of removing all the things that are required for acting. But once those things have been posited, natural causes cannot prevent the action of a necessary agent, since they do not have the power either to change the nature of things or to remove wholly intrinsic properties (Ibid., p. 281).

>...it involves a contradiction to remove that which is natural in the absence of any contrary efficient causality, or at least without withholding the assistance or efficient causality that is required on God's part. For how can a natural action be prevented if no impediment is posted? (Ibid., p. 281).

Suárez thus not only agrees with the necessitating nature of (natural) efficient causes, but gives a similar justification for their necessity as the one offered in Chapter 1: A power cannot fail to act in the requisite circumstances, because it's failing to do so *would contradict the very*

nature of that power. Consequently, for Suárez, such powers *must*, with metaphysical necessity, act in the requisite circumstances.

Moreover, Suárez taught that "...to depend efficiently (*efficienter*) is to receive from another one's own being distinct from that which is in the cause" (2004, p. 70). Thus, like Avicenna, Suárez consciously broke from Aristotle's narrow definition of causation as a source of change,[36] to causation as a source of being: "...if we replace the words [in Aristotle] 'change or rest' with the word 'action', the definition will encompass every efficient cause, even the First Efficient Cause insofar as he creates. For, as we will see below, creation, too, is an action, even though it is not a change" (1994, p. 8). For Suárez and other scholastics, creation is not a change because it involves no preexistent matter which subsequently receives a new form. Instead, creation, the ultimate act of efficient causality, involves the generation of an entire hylomorphic compound *ex nihilo*, and thus has no preexistent subject or set of potencies, such as prime matter, which are then actualized in some way. Alfred J. Freddoso nicely summarizes this aspect of Suárez' thought, writing in his translation of *Metaphysical Disputations 17, 18, 19* (1994) as follows:

> Suarez takes the core notion of efficient causality to involve the communication of some sort of being (*esse*) to a substance by an agent via an action. He speaks of the communication of *esse* rather than of the communication of form (or formal perfection) in part because this leaves conceptual space for a sort of efficient causality—viz., creation *ex nihilo*—in which the effect is not just a formal perfection inhering in a preexistent subject but is instead the being of *all* the constituents, material as well as formal, of a given substance (p. 9).

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[36] Though Suárez also broke with prior tradition by defining *all four* Aristotelian causes as sources of being. For Suárez, formal and material causes communicated being in an "internal" way, whereas final and efficient causes communicated being in an "external" way.

Unsurprisingly, Suárez also followed his predecessors in insisting that at least essential causes, causes of the very being of a thing, are simultaneous with their effects. He writes, "...essentially (*per se*) subordinated causes...[act] simultaneously and each in its own order immediately have influence on the effect" (Ibid., p. 68). And, again like his scholastic forebears, for Suárez the paradigmatic case of simultaneous causation was that of God's conservational causation of created being:

> ...the necessity of conservation is likewise sufficiently inferred from the imperfection of created *esse*. For if created *esse* were of itself such that it could endure for as much as a moment without the actual influence of the First Cause, then it would also be able to exist without such influence at the first moment, or in eternity itself, and it would not be its intrinsic nature require dependence on another—which is a property of infinitely perfect *esse* (2002, p. 119).

We thus find a clear tradition throughout the middle ages and into the Renaissance of conceiving the causal relation in terms of power, simultaneity, the generation of being, and at least for some causes, necessity. It was, of course, no accident that such a conception should have been held so widely. The notion that causation is powerful and necessitating was simply taken over and developed from "The Philosopher," Aristotle, whose influence on late medieval thought cannot be overstated. Further, that causation is simultaneous and existential was influenced both by the Neoplatonism of late antiquity, with its timeless hierarchy of emanations from the One, as well as Islamic and Christian concerns to have an adequate philosophical framework for capturing the creational and conservational activity of God. Ian Wilks (2014) notes the connection between this dual theistic and Neoplatonic influence when he observes that "[t]hinking of divine creation as the defining case of efficient causation is as much an element of

the twelfth-century outlook as it is of earlier Platonically-inspired outlooks, and continues so through later medieval speculation" (p. 103).

But this conception of causality, far from being merely ornamental to their metaphysical system, did positive work. In particular, it enabled such philosophers to argue for a first cause of being in a way unavailable—indeed *unintelligible*—for moderns who embraced a Humean conception of causality, according to which it neither involves power nor the production of being. It is to an exploration of this form of argument, a form of argument I will seek to revive in the next and final chapter, that I now turn.

§2. **Power, Essential Order, and the First Cause**

We have seen that, according to this medieval tradition, there is a kind of efficient causation that is powerful, simultaneous, necessitating and existential. Causes of this sort were thought to generate causal series that had an "essential" or "per se" order. Roughly, these are causal series in which the continuing causal activity of any member was essentially required for the ongoing causal activity of the subsequent member. In this section, I explore this concept of an essentially ordered series, and how it enabled Scotus and Aquinas to argue for a first cause of being.

The concept of a series ordered *per se*, however, has its origins in Aristotle, who focused on the way in which such a series can be generated in the case of motion. As we saw previously, Aristotle's concept of causation did not include the concept of existential production, but only motion. That is, only causation that involved a substance acting on some preexisting patient to actualize in it some new form. However, Aristotle's scholastic followers, armed with their expanded existential conception of causation, would similarly expand the notion of an essentially

ordered series of movers to the notion of an essentially ordered series of existential causes. And

where Aristotle argued that in such a series there must be a first mover, Scotus and Aquinas

would argue that in such a series there must be a first cause of being itself.

Let us begin, then, with Aristotle.

2.1 **Aristotelian Origins**

Aristotle, in the course of discussing a causal series involving motion in his *Physics*,

comments as follows:

> Now this [things that are in motion being moved by something] may come about in either
> of two ways. Either the movent [thing being moved] is not itself responsible for the
> motion, which is to be referred to something else which moves the movent, or the movent
> is itself responsible for the motion. Further, in the latter case, either the movent
> immediately precedes the last thing in the series, or there may be one or more
> intermediate links: e.g. the stick moves the stone and is moved by the hand, which again
> is moved by the man: in the man, however, we have reached a movent that is not so in
> virtue of being moved by something else. Now we say that the thing is moved both by the
> last and by the first movent in the series, but more strictly by the first, since the first
> movent moves the last, whereas the last does not move the first, and the first will move
> the thing without the last, but the last will not move it without the first: e.g. the stick will
> not move anything unless it is itself moved by the man. (*Physics*, 256a3-21).

There are two noteworthy features of this passage relevant to our subject. First, Aristotle

draws a sharp distinction between "primary," and "instrumental" or "intermediate," causes. His

example is a man moving a stick, which moves a stone. In this case, the instrumental cause of the

stone's motion is the stick, while the primary cause is the man. And for Aristotle this distinction

is not a *relative* one: It is not simply because the man happens to be *earlier*, or more generally

"prior in order," in the series to the stick that he must be considered the primary source of

motion. Similarly, it is not simply because the stick happens to be *subsequent*, or "posterior in

order," in the series that it is to be considered instrumental. Rather, it is something about the *intrinsic natures* of the man and the stick that *necessitates* their forming the order that they do—that necessitates, that is, the one being primary and the other instrumental. You couldn't, for example, simply replace the order of the man and the stick in the series and get the same result.

The reason why, according to Aristotle, is that "we say that the [stone] is moved both by the last and by the first movent in the series, but more strictly by the first, since the first movent moves the last, whereas the last does not move the first, and the first will move the [stone] without the last, but the last will not move it without the first: e.g. the stick will not move anything unless it is itself moved by the man" (Ibid.). That is, the man is the primary mover because he has *the intrinsic capacity or power* to initiate motion, whereas the stick does *not* have this capacity or power, or at least does not have this power in the same way (more on this in Chapter 3), and therefore is essentially an instrumental or intermediate cause in the series. In this sense, the motion of the stick essentially depends on the ongoing motion of the man, in such a way that if the man were to cease moving it, it would necessarily cease to move. And the same, of course, applies to the stone. It follows that the motion of the man is an "essential cause" of both the motion of the stick and that of the stone. In the words of the Philosopher, "it is impossible for that with which a thing is moved [the instrumental agent] to move it without being moved by that which imparts motion *by its own agency* [the primary agent]" (Ibid., 256a25; emphasis added).

Second, it is precisely this essential causal dependence between the members of the series that leads Aristotle to reject the possibility of an infinite regress in such a series. That is, because in a series of essentially dependent causes the posterior members are causally impotent in themselves, and thus must "borrow" their causal efficacy to move from some prior agent, the

series must eventually terminate in some agent that possesses in itself the causal power that is possessed in a purely derivative way by all subsequent members.[37] As Gyula Klima (2013) observes, for an Aristotelian,

> ...if [a cause's] power to bring about or sustain its per se effect is insufficient on its own account, then an agent producing its per se effect must receive the energy it is missing from another cause, acting as an intermediary cause, channeling, as it were, that is, receiving, transforming and transmitting the power it receives from its cause, which therefore will be the proximate cause of this intermediary cause and the remote cause of the intermediary cause's effect. (p. 40)

This point is crucial to grasp, for it has been lost on many philosophers that it was *not* simply the existence of an actual infinite in itself that was the problem Aristotle, and his scholastic followers, had with such causal series.[38] Instead, what they found problematic was something they believed was *entailed* by supposing such a series to be infinite. Aristotle states the *reductio* as follows: "[I]t is impossible that there should be an infinite series of movents, each of which is itself moved by something else, since in an infinite series *there is no first term*" (Ibid., 256a; emphasis added). It has seemed to some that Aristotle simply begs the question

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[37] Note that philosophers like Aristotle and his medieval followers did not make a distinction between what modern mathematicians would call "well-founded" and "non-well-founded" infinities. They assumed that if a series was infinite it could not have a first member, and thus seemed not to have a concept of a well-founded infinity. An example of a well-founded infinite series would be a world (perhaps our own) in which time is dense, but in which time has a beginning. Because it is dense, there exists a time between any two times. Thus, between the present moment and the first moment there exists an infinite series of moments. But there is, nevertheless, a first moment. Similarly, there may exist a first cause of all being even if that causal series has an infinite number of members, as long as the causal series is dense.

For ease of exposition, I will in what follows simply refer to non-well-founded infinite series simply as "infinite series." Keep in mind, however, that the reasoning deployed by Aristotle and his followers is meant to show only that every series of an essentially ordered sort has a first cause. But their reasoning does not preclude the existence of a well-founded infinite series with a first cause.

[38] This confusion can be seen, for example, in Russell (1969, p. 453), and Hick (1990, p. 20).

against the possibility of infinite causal regress with this argument, for isn't whether there need be a first member to such a series the very thing in question?

But this would be to misunderstand what Aristotle means by "first." As we have just seen, "first" here does not simply mean *numerically* first (though of course he means this as well), but more importantly it means *primary*—as in the primary agent, whose intrinsic causal power gets the series going.[39] Aristotle, then, far from begging the question, argues that there must be a first in *number* because there must be a first *in agency*. Edward Feser (2013) illustrates this point of Aristotle's thought when he writes,

> The situation [of a non-terminating essential causal order] would be comparable to a mirror which reflects the image of a face present in another mirror, which in turn reflects the image of a face present in another, and so on *ad infinitum*, with only mirror images and never any actual face. Notice that the *length* of the series is not what is at issue here. Even if there could be an infinitely long series of mirrors each reflecting the image of a face present in the next mirror in the series, there would still have to be something outside this infinite series—the face itself—which could impart the content of the image without having to derive it. Similarly, even if the stick that moves the stone was being moved by another stick, which was in turn moved by another, and so on *ad infinitum*, there would have to be something outside the series of sticks which imparted to them the power to move things, since sticks by themselves have no such power, however many of them you add together (p. 161).

Here we find the inchoate beginnings of what Aristotle's scholastic followers would later call an "essentially ordered" causal series. That is, a causal series in which each $n+1^{\text{th}}$ member essentially depends upon the prior member, *n*, to sustain its causal activity—as, for example, the stick essentially depends upon the motion of the hand to sustain its activity of moving the stone.

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[39] Here and elsewhere in this chapter I refer loosely to "intrinsic" versus "derivative" causal power, or causal power possessed "in itself" versus "borrowed" power. This loose way of speaking will be refined in Chapter 3, where the distinction is specified in terms of "productive" versus "conductive" causal power.

Thus, Aristotle considers a series in which the motion of every member (save the first) is essentially caused by the motion of the prior members. In such a series there *must* be a first, for that any member in the series is in motion at all cannot be explained only by other members whose motion is also entirely derivative. We must, eventually, come to something with a non-derivative, or intrinsic, power to move: that which bestows motion upon all subsequent members that in themselves have no such intrinsic motive power. Put another way, in a series in which each member has only the "conditional" power to move *if moved*, no motion could ever occur. The antecedent of this chain of conditional powers could never be affirmed, so to speak.

Although Aristotle's work was suggestive of the distinction between essentially and accidentally ordered causal series, it never received the detailed articulation to be found later in the scholastics. It is to them that I now turn.

2.2 **The Scholastic Development**

Let us begin with Aquinas.[40] One of his clearest discussions of the essentially/accidentally ordered distinction can be found in the *Summa Theologica*, where he writes,

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

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[40] Avicenna's argument for a First Necessary Existent also likely took the form of an argument from an essentially ordered causal series, though less explicitly than in Aquinas and Scotus. For a recent and compelling defense of the idea that this is indeed the sort of argument Avicenna had in mind, see Byrne (2019).

particular man as generator to be generated by another man; for he generates as a man, and not as the son of another man. For all men generating hold one grade in efficient causes—namely, the grade of a particular generator. Hence it is not impossible for a man to be 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. (*ST,* 1.46.2)

There is much to unpack in this short, but subtle, passage. In it, Aquinas distinguishes essentially ordered and accidentally ordered causal series, claiming that only the former must terminate in a first cause. To understand why, we must follow the Angelic Doctor's reasoning carefully. He begins by asserting the impossibility of an infinite regress of *per se*, or essential, causes—that is, causes that are required to maintain an effect from moment to moment. In this sense, what Aquinas means by a "per se" or "essential" cause can be identified with the *conservational* cause in his three-fold classification of efficient causes discussed earlier.

Further, that Aquinas utilizes Aristotle's example of the causal series involving a hand moving a stick which moves a stone suggests that he is thinking of essentially ordered causal series along the same lines: an essentially ordered series is one in which each effect depends at every moment on the ongoing activity of its cause, and in which the intermediate causes exercise their causal power in a purely derivative way. Thus, Aquinas takes it for granted that such a series must terminate in a first cause exercising the power in a basic way that all subsequent members of the series exercise only in a derivative, participatory way. He then proceeds to contrast such a series with a series constituted by *accidental* causes, clarifying what he means by such a series with two examples.

First, he considers an artificer using a series of hammers, one after the other, to build something—say, a table. Aquinas then draws our attention to the action of each individual hammer. We are thus meant to consider a causal series constituted as follows: The action of

hammer$_1$, the action of hammer$_2$, the action of hammer$_3$, and so on. The action of these hammers is of course causally connected in that each makes a causal contribution to the eventual construction of the table. Put otherwise, the actions of the various hammers are each part of a single *causal process* that will terminate in the table's being constructed. However, there is another sense in which the series of hammers is causally *disconnected*, and they are thus only "accidentally" related. The individual action of any one hammer, hammer$_n$, is in no way dependent upon the action of the prior hammer, hammer$_{n-1}$. This is because the exercise of each hammer's power to hammer is something that in no way depends upon, for its very act of hammering, the prior hammer (though, of course, it *does* essentially depend upon the action of the artificer). Thus, the causal activity of each hammer is related only *accidentally* to the causal activity of the prior hammer. That is, it is not essential to the action of each hammer that the prior have acted. Rather, it is merely because the present hammer happens to be a part of this causal process that it was causally preceded by another hammer. There is nothing, then, that logically demands that this series of hammerings must terminate in a "first hammering." Each hammer may exercise its own causal power independently of the last, and there thus need be no "first" hammer from which the subsequent hammers derive causal their activity.

Aquinas' second example involves a series of biological reproductions, one father generating a son, who himself was generated by another father, who was generated by another father, and so on stretching back to infinity. Just as in the hammering case, each man's exercise of reproductive power in the series in no way essentially depends upon the prior's exercise of reproductive power. Each man, *qua* man, has the power to reproduce (though of course with the help of another), a power that he retains even if the father that contributed to his own generation has passed away. Just as each hammer, *qua* hammer, has the power (with the help of the

artificer) to hammer, and this power is retained even if each prior hammer has been destroyed. Thus each man in the infinite series of generation is related, *qua* generator, merely accidentally to his father. That is, it is not *qua* man, or *qua* generator, that each man's reproductive activity depends upon the reproductive activity of his father. It is only *qua* having been originated that each man so-depends. This is what Aquinas means in saying that "it is accidental to this particular man as generator to be generated by another man; for he generates as a man, and not as the son of another man" (Ibid.). Thus, each man may exercise his reproductive power, one after the other, and we need not terminate in some first father on whose reproductive activity each of the following father's essentially depends. However, Aquinas asserts that the series *would* have to terminate *if* the reproductive activity of a man did essentially depend upon the ongoing causal activity of another—as, for example, it *does* essentially depend upon the cooperative activity of a woman, on the elements from which they are composed, and so on.

Aquinas, however, moves beyond Aristotle in a crucial way—a way that ends up connecting the notion of the essentially ordered series to the notion of ground as defined in Chapter 1. Aquinas saw that the Philosopher's observations about motion are simply a special case of an observation about being, or *esse*, more generally. The motion of the stone is given being by the ongoing motion of the stick, which itself receives its being from the man moving it. Thus, there is nothing unique about motion that makes it apt for generating an essentially ordered series. Rather, essentially ordered causal series are generated in *any* case wherein something's act of being—whether that is *being in motion*, *being human*, *being warm* or anything else— cannot be actualized by the thing itself, and so is essentially dependent upon the conservational, actualizing activity of its underlying causes. A key term here is *conservational*, for when Aquinas is thinking of that which is causally responsible, *per se*, for something's being, he does

not mean in the sense of that which is required for its *coming to be*. This, in Aquinas's terms, would be a cause of *generation* or *becoming*, but not of *being.* The cause of something's being is that which *conserves* or *sustains* it in its existence from moment to moment.[41]

The key text in which Aquinas explores this kind of argument is *On Being and Essence*, where he offers an argument for the conclusion that in an essentially ordered series of efficient (conservational) causes of being there must be a first. There he argues as follows:

> Whatever belongs to a thing is either caused by the principles of its nature, for example, risible in man; or comes to it from some extrinsic principle, as light to air from the influence of the sun. Existence cannot be caused by the form or quiddity of a thing—I mean as an efficient cause—because in this way a thing would be a cause of itself and produce itself in existence, which is impossible. Therefore it is necessary that each thing whose existence is other than its nature has its existence from another. And because whatever is from another is reduced to what is *per se* as its first cause, there must be something which is the cause of the being of all things by the fact that it is existence alone, otherwise there would be an infinite regress in causes, since everything which is not existence alone has a cause of its existence, as has been said (1998, p. 42).

Let us unpack Aquinas' argument. First, it is critical to grasp that Aquinas believes the relation between essence and existence to be a relation of *potency to act*. What a thing is, its essence, whether general ("animal"), or particular ("Socrates"), does not, at least in contingent beings, entail that they exist. That is, it is not part of the essence of such beings that they exist. In this sense, their essences are merely *potentially* existent. But every potency must be actualized by something already *in act*. And in the most basic case of a potency for *esse*, being itself, that potency must be actualized by something already *in the act of esse*. Second, Aquinas insists that this actualization cannot come from the thing *itself*. For if it did, then the thing would have to already exist (for only existent things can serve as efficient causes) in order to give itself *esse*,

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[41] For more on this distinction in Aquinas, see Rota (2012).

thus generating an inadmissible circular explanation of its *esse*. Aquinas concludes that "it is necessary that each thing whose existence is other than its nature has its existence from another" (Ibid.).

Next Aquinas asserts the principle that is the linchpin of his argument against an infinite regress of essential causes, that "whatever is from another is reduced to what is *per se* as its first cause" (Ibid.). What does Aquinas mean by this principle? I believe that, given the context involves essentially ordered efficient causes, Aquinas has in mind Aristotle's distinction between primary and secondary, or instrumental, causes. That is, what is *per se* in this context is the agent that possesses the power *in itself* to generate the causal series—in this case, the power *to give being*. And all of the secondary causes, which have their being "from another," are those which are able to cause being in their effects only by borrowing the causal power of the first agent to cause being. They must borrow this causal power, moreover, because, unlike in an accidentally ordered series, each conservational cause of something's being in an essential order, insofar as it is caused to cause something else's being, has no power in itself to cause being.

We can see Aquinas following Aristotle in understanding the distinction between primary and secondary causes in terms of intrinsic and derivative powers in various places throughout his work. For example, in the *Summa* he writes, "It happens...that something may participate in the proper action of another not by its own power, but instrumentally, in so far as it acts by the power of another..." (*ST* 1.45.5), and "...an instrument does not bring forth the action of the principal agent by its own power, but in virtue of the principal agent" (*ST* 2.1.112.1). And similarly, "...the power of the principal agent exists in nature completely and perfectly, whereas the instrumental power has a being that passes from one thing into another, and is incomplete; just as motion is an imperfect act passing from agent to the thing acted upon" (*ST* 3.62.4). It

seems likely, then, that what Aquinas meant by this principle in *On Being and Essence* is in this vein as well: Because in an essentially ordered series of existential causes each secondary cause causes the being of its effect in a derivative way, the exercise of this derivative power must terminate in something which possesses the power to generate the being of the entire series *per se*, essentially, "in itself." Thus, an infinite regress in essential causes of being is impossible, and there must exist a first cause of *esse*. In a later composition, the *Questiones Disputate de Potentia Dei*, Aquinas stated the same conclusion as follows:

> It must follow that only the first cause gives being as such by its own power, and whatever other cause gives being does so insofar as the power and operation of the first cause is in it, not by its own power. Thus an instrument performs an instrumental operation not by the power of its own nature but by the power of the one who moves it (2011, p. 29).

That the core idea behind Aquinas' argument for a first cause in *On Being and Essence* as well as in his first two Ways in the *Summa* is derivative causal power depending on non-derivative causal power has recently been defended by Gaven Kerr (2015), Caleb Cohoe (2013), and Edward Feser (2013). Their work has, in my view, offered an important corrective to both popular and academic misunderstandings of Aquinas's cosmological arguments—misunderstandings that, for example, wrongly impute to Aquinas a general antipathy for actual infinities. Cohoe, for example, helpfully summarizes many of the points I have made above when he writes,

> Because these intermediate causes possess causal powers only by deriving them from all the preceding causes, they need a first and non-derivative cause. Something can have a causal power derivatively only if that causal power can, in fact, be derived from something else. If there were only intermediate and derivative causes, then there would be no source from which the causal powers of the intermediate causes could be derived,

regardless of whether there were a finite or an infinite number of intermediate causes. If there were no first, non-derivative cause, the intermediate causes would not actually be causes and the effects observed in the first three ways would lack a cause capable of producing them. There would be ontologically dependent entities with nothing on which to depend. This is impossible (2013, p. 840).

Along similar lines, Kerr unpacks Aquinas' *per se/per accidens* causal series distinction as follows:

> Given the participation of the posterior causal relata in the efficacy of the primary cause in the *per se* series, the primary cause both causes and sustains the members of that series, such that without the presence of the primary cause to the members of the series (the hand-stick-stone in our example) those members would be causally inefficacious. On the other hand, in the [per accidens] series, the cause simply causes and does not sustain, since its causality is exercised and terminated in a single act. Thus, in the example, the father procreates and thus causes his son, but *qua* biological father, as opposed to guardian, he does not sustain his son in existence (2015, p. 140).

Even the Angelic Doctor, however, did not rise to the expository clarity of the Subtle Doctor on this issue. In his central metaphysical work, the *De Primo Principio*, Scotus articulates and develops the distinction between essentially and accidentally ordered causal series in detail, and deploys them, like Aquinas, in an argument for a first cause of being.

There are two primary dimensions along which Scotus distinguishes accidentally and essentially ordered series. First, "in essentially ordered causes the second, in so far as it causes, depends upon the first; in accidentally ordered causes it does not, although in its being or in some other way it does depend" (1949, p. 43). According to Scotus, that is, in an essentially ordered series each secondary cause depends upon its prior cause(s) *in the very act of causing*: "...the posterior in causing depends upon the prior in causing" (Ibid. p. 15). For any intermediate member of such a series, b, b is caused to cause c by a.

To illustrate, consider again the hand-stick-stone case. Not only does the hand cause the stick to move, but it additionally *causes the stick to cause the stone to move*. In this sense, secondary causes in an essentially ordered series merely pass on the causal activity of their priors—they are what we might call "causal conduits." Or consider a flashlight casting its beam on a mirror. Not only does the electricity powering the flashlight cause the beam to be cast on the mirror, but it also *causes this beam to cause* a second beam of light to reflect off of the mirror. The moment you turn off the flashlight, this entire causal chain collapses. And this is because each part of the causal chain essentially depended upon its prior for its ongoing causal activity.

Frank and Wolter (1995), in a helpful commentary on and illustration of this distinction in Scotus, write as follows:

> In causing E, A depends upon B in its very act of causing; for example, in order to propel air, the mechanical energy of a fan blade is dependent upon electrical energy; or to take a second example, in the genesis of a zygote, the causality of the male sperm is dependent on the causality of the female egg. By contrast, when accidentally ordered causes are involved, although A may be dependent upon B for its original existence, B subsequently acts independently of A in its relationship to E. To use Scotus's example, although a son is begotten by his father, his own procreative act proceeds independently of his father's (p. 83).

And Peter King (2003) brings out the connection in Scotus between this notion of causing-to-cause, and the exercise of power, when he writes,

> I am the proximate cause of the stick's causality, since the stick only causes the stone's motion through my exercise of my causal power. The stick might have the power to move the stone (the way a soap bubble, say, never could), but the power is inert until I exercise my powers. Thus, my power to bring about the stick's causal activity is more perfect and complete than the stick's mere power to do so. Furthermore, it is clear that the stick exercises its causality to move the stone only so long as I am exercising my powers; the stick's causality must be concurrent with my exercise of my causality (2003, p. 41).

According to Scotus, then, the first mark of an essentially ordered series is that in such a series all secondary members are caused to cause the subsequent member(s). By contrast, the first mark of an accidentally ordered series is the opposite of this: In such a series, no member causes the causality of the subsequent member(s). Instead, each member may exercise its causal power independent of the previous member. As, for example, in our earlier hammer case, each hammer can exercise its hammering power in a way that is not essentially caused by the exercise of the previous hammer's causal power.

The second mark of an essentially ordered series Scotus takes to logically follow from the first: The simultaneity of cause and effect. According to Scotus,

> ...all the per se and essentially ordered causes are needed simultaneously to cause the effect; were this not so, some per se and essential causality would be lacking to the effect. But such simultaneity is not required where accidentally ordered causes are concerned, for they exercise their causality successively, one after the other" (1995, p. 47).

A short *reductio* can be extracted from this passage. Scotus asks us to assume, for sake of argument, that a *per se* cause of an effect were absent at any moment the effect is taking place. In that case, the effect could exist in the absence of a cause that is absolutely necessary to sustain that effect. This, of course, is a contradiction. For the very definition of an essential, or *per se*, cause, is one which is required for the very existence of an effect. We encountered this line of reasoning earlier while discussing both Avicenna and Aquinas. Scotus is then simply following his predecessors in assuming that it is a mark of the relation between an essential cause and its effect that the latter cannot exist without the former simultaneously existing. It follows that a causal series composed of such essential causal relations will itself involve a series of causal relations all of which obtain simultaneously.

By contrast, causal simultaneity will not, or at least not necessarily, hold in a series ordered *per accidens.* In the case of a series ordered *per se*, it was the derivative exercise of power that necessitated the simultaneous presence of that from which a thing is deriving this power. However, as we have seen, in a *per accidens* series, each member can exercise its causal capacity independently of the prior member(s). Consequently, there is no need for any of the prior members to be present while later members exercise their own causal power.

Like Aristotle and Aquinas before him, Scotus argued that in any essentially ordered series there must be a first, or primary, cause. And this (also like Aristotle and Aquinas) because there must be something with a basic power that is the source of the derivatively exercised power of later members. He summarizes this argument for a first, efficient cause in an essentially ordered series as follows:

> Some being is an effect, because it is produced. Now either nothing produces it, or it produces itself, or it is produced by another. It is not produced by nothing, for nothing is the cause of nothing. Neither does it produce itself, for - according to Bk. I, chapter nine of Augustine's *De Trinitate*, "nothing begets itself." Therefore it is produced by another. If by another, then this other is produced by nothing, by itself or by another - and so the process would continue indefinitely. Consequently, *one must stop with something not produced, but which produces by its own power and not in virtue of any other, and this I call the first* (1982, p. 259; emphasis mine).

Much remains to be clarified about this style of argument, and potential objections answered, all of which will be explored in the next chapter. For now, it suffices to notice how this sort of argument provides raw materials for formulating an argument for grounding foundationalism: If ground is existential, powerful causation, as argued in Chapter 1, it's precisely the sort of causal relation that philosophers such as Aquinas and Scotus believed generates an essentially ordered series that must terminate in a first cause. We have seen that in

an essentially ordered series, all members are required simultaneously to generate an effect. A series of ground is just such a series, with grounders simultaneously causing the being of that which they ground. Moreover, in a grounding series each member (save the last) *causes the causality* of the next. A member *a* causes the once-removed being of *c* by causing the being of *b*, and so, in that sense, *a causes b to cause c.* The ground is thus set for an revival of this form of argument to a first cause of being, and so for grounding foundationalism.

§3. **Conclusion**

Let us take stock of where we have been, and where we are going. The conception of existential causation found in the medievals was an evolution of an earlier view of causation found in Aristotle. While both Aristotle and the medievals conceived of causation in terms of powers, necessitation (for non-rational agents), and synchronicity, where Aristotle saw causation as applying only to the realization of material potencies for *change*, his medieval followers saw it as extending to the realization of a whole substance's potency for *being*. Some of the theoretical motivations for this change were to capture the Neoplatonic concept of emanation (for Avicenna), and the Christian-theistic concept of creation (for the Scholastics). The philosophical *argument* for the shift, however, arose from the essence/existence distinction: Once we admit that there must be a real distinction between the essence and the existence of a thing, the question immediately arises as to why an act of existence is combined with a particular essence. To answer this question, we must appeal to a kind of *existential* causation that involves the bestowing of being on a particular essence.

In this light, my project can be viewed as an attempt to add to the recent renaissance of Aristotelian thinking about causation its medieval development. We ought to follow the likes of

Avicenna, Aquinas, Scotus, and Suarez in extending the notion of powerful causation to powerful *existential* causation. Doing so promises to allow us to unite into a synthetic whole recent work on grounding and causation. And, most interestingly, it may allow us to settle the debate between infinitists and foundationalists about grounding in favor of foundationalism. I intend to argue as much, at least, in the next and final chapter.

Chapter 3:
Powerful Causation, Ground, and a Neo-Scholastic Argument for Foundationalism

In the first chapter, I argued that we should identify ground with powerful, existential causation (GPC). In the second, I showed that the existence of this kind of causation was accepted by medieval philosophers such as Aquinas, Scotus, and others. According to these philosophers, this form of causation generates what was called an "essentially ordered" causal series, and they argued that any such series must terminate in a first cause. If their reasoning was sound, then a door is opened to developing a neo-scholastic argument for grounding foundationalism: the view that all chains of ground must terminate in something fundamental that grounds all else. The argument is as follows:

(p1) Every grounding chain is an essentially ordered causal series.

(p2) Necessarily, every essentially ordered causal series terminates in a first cause.

∴ Necessarily, every grounding chain terminates in a first cause (ungrounded grounder).

It is the purpose of this third, and final, chapter to defend in detail this argument for foundationalism. The first premise, we will see, requires little defense, as it follows by definition from GPC and the concept of an essentially ordered series. It is to the second premise, then, that the bulk of my defense will be dedicated.

I will defend (p2) by way of a more precisely formulated version of the kind of argument given for (p2) by Aquinas, Scotus, and their followers sketched in the previous chapter. This argument, if successful, offers compelling reason to think that (p2) is true. And so, along with the

more straightforward defense of (p1), I will conclude that, if we accept GPC, we have good reason to accept grounding foundationalism.

I proceed as follows. In §1, I provide precise formulations of the concepts essential to properly understanding the arguments to follow. In §2, I show how, given the conceptual clarifications given in §1 and the truth of GPC, the truth of (p1) follows. In §3, I unpack and defend my neo-scholastic argument for (p2). In §4, I make some general observations and conclude.

§1. **Preliminary Remarks**

1.1. **Powers: Productive and Conductive**

My argument, following the scholastics, hinges on the distinction between accidentally and essentially ordered causal series. But this distinction hinges on a deeper one between two kinds of causal power: what I shall call "productive" and "conductive" power, but which the scholastics called "primary" and "secondary," or "principal" and "instrumental," power (why I believe my way of casting the distinction is more helpful than the scholastics' will become apparent in what follows). If this distinction is not kept clearly in mind, the force of the arguments to follow will remain opaque. So what does the distinction amount to?

We can get a grip on the distinction by thinking of it as marking two different *ways* of possessing a power for the same activity, and providing some concrete illustrations in light of this.

To possess a *productive* power to φ is to be capable of acting as a generative source of the activity of φing; it is to be capable of φing without needing to receive the activity of φing, and be sustained in one's φing, by something else that is φing.

By contrast, to possess a *conductive* power to φ is to only be capable of being a *recipient* and potential *transmitter* of the activity of φing; it is to be capable of φing (and potentially passing on the activity of φing) *only if* one receives the activity of φing, and is sustained in one's φing, by something else that is φing.

That the exercise of conductive powers must be sustained by something else engaged in the same activity, and productive powers need not, intuitively follows from the concepts of production and conduction. To produce an activity is, as I have just defined it, to be a generative source of that activity. And something would not be a generative source of an activity if it had to be sustained in that activity by something else engaged in that very activity. Conversely, to conduct an activity is, by definition, to merely be a receiver and potential transmitter of that activity. Thus, without something conserving a conductor in its activity, it would cease to be receiving that activity from something else, and so *per impossible* become a productive source of that activity.

Illustrations of the productive/conductive power distinction can be found both in the "manifest image" of everyday, observable causal interactions, as well as in the "scientific image" of causal interactions postulated by the special sciences (Sellars, 1962).[42]

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[42] The extent to which the manifest image of everyday, phenomenological experience accurately reflects the ontological and causal structure of the world, or is reconcilable with the scientific image, is, of course, of perennial controversy. I include illustrative cases from both domains in order to appeal to a variety of positions regarding such issues a reader might have: From anti-reductionist Aristotelians inclined to believe the manifest image reveals genuine substances and their causal relations—substances irreducible to, though constituted by, their microphysical parts; to

Before proceeding to discuss these examples, however, a methodological note is in order. These examples are not meant to serve as entirely uncontroversial cases of the productive/conductive power distinction. Instead, they are, taken collectively, merely meant to make the distinction between conductive and productive powers *intelligible* in such a way as to motivate the reader, despite any reservations he or she might have regarding whether the distinction is present in any specific case, to see that the distinction (1) is coherent, and (2) plausibly applies to the grounding case.

1.1.a **Manifest Cases**

Beginning with examples drawn from everyday, perceptible causal interactions, we can first consider the relation that exists between a fire, a metal pot, and a hand.[43] Both the fire and the metal pot have a power to heat, but they possess this power in fundamentally distinct ways: the fire has the power to *produce* heat, whereas the metal pot has only the power to *conduct* it. The fire, in virtue of the kind of substance (or process) that it is, can heat my hand without itself needing to be heated. The metal pot, by contrast, cannot. Instead, it must first receive the activity of heating, and be sustained in its own heating activity, by something else: the fire. The fire is, in this sense, an "unheated heater," whereas the metal pot is a mere "heated heater."

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scientific reductionists, inclined to think all that exists, at bottom, are the fundamental entities postulated by the sciences, and their associated causal relations.

[43] It must be kept in mind that in this and the rest of the manifest image examples to follow, I am presupposing that the relevant perceptible substances and effects cannot be reduced to, though they are in some sense constituted by, their microphysical parts. Heat and illumination at this phenomenological level, for example, I am presupposing are more than what the descriptions of these phenomena are in terms of molecular motion or photon emission. Those who believe the objects, processes, and effects encountered in the manifest image are all fully reducible to that of the scientific image are free to disregard these cases, and consider only the cases drawn from physics and biology to follow.

Next consider a flashlight casting illumination on a mirror at a 45 degree angle. The mirror, upon receiving illumination from the flashlight, thereby reflects that illumination and illuminates the region of space adjacent to it. Both the flashlight and the mirror, in this case, have a power to illuminate. But again, they have this power in distinct ways: the flashlight has a power to *produce* illumination, whereas the mirror has merely the power to *conduct* it. The flashlight, in virtue of the kind of thing (or structure) that it is, has a power to illuminate something without needing to first be illuminated itself, and be sustained in its illuminating activity, by another illuminator. Not so with the mirror. It can only illuminate something if it first receives illumination from some distinct illuminator, and it must be sustained in its illuminating activity thereby. The flashlight is an "unilluminated illuminator," whereas the mirror is an "illuminated illuminator."

Finally, consider the causal relation that exists between the locomotive that pulls a train and all of the boxcars attached to it. The locomotive, in virtue of the kind of thing (or system) that it is, has the power to *produce* the forward motion of the boxcars attached to it. By contrast, the attached boxcars merely have the power to *conduct* the forward motion of the boxcars attached to *them.* A locomotive can pull boxcars without itself being pulled, whereas a boxcar can only pull other boxcars if it first receives, and thereby transmits, this pulling activity from something else. The locomotive is thus an "unpulled-puller," whereas the boxcars are mere "pulled-pullers."

1.1.b **Scientific Cases**

Some readers, however, might suspect that the manifest image is misleading in this regard. Perhaps there only *seems* to be a fundamental distinction between productive and

conductive power because we are ignoring the causal processes, described by the physical sciences, that truly undergird the perceptible phenomena.

I admit that it is difficult to clearly describe the above cases of heating, illuminating, and pulling in terms of the scientific image in such a way as to preserve the clear distinction between production and conduction that seems present at the manifest level. Despite this difficulty, however, I believe there are *other* cases, drawn from both physics and biology, where the same distinction plausibly holds.

Consider first the relationship between a massive object such as a black hole (though any object with mass would do), the warped spacetime resulting from the black hole's mass, and the gravitational waves generated by the black hole's warping of spacetime as it accelerates.[44] Any object with mass, simply in virtue of having mass, has the power to warp, or "curve," spacetime. As physicist John Wheeler famously summarized General Relativity, "Spacetime geometry 'tells' mass-energy how to move; and...mass-energy 'tells' spacetime geometry how to curve" (Ciufolini and Wheeler, 1995). In this sense, the black hole has the power to *confer* the activity of warping on the fabric of spacetime. But once spacetime is warped as the black hole accelerates, the energy from this warping thereby causes gravitational waves to ripple outward from the initial warping. These gravitational waves are themselves additional warpings, or "propagating distortions in the spacetime curvature" (Feldbaum, 2020), radiating outward.

Both the black hole and the region of spacetime affected, then, possess (in a generic sense) the power to warp spacetime. The black hole causes the initial warping, and this warped region proceeds to cause further warpings radiating outward. But the black hole and the

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[44] I am indebted to Dr. Christian Santangelo for suggesting this example. Gravitational waves, generated through the collision of two orbiting black holes, were first detected in 2016. See: B. P. Abbott *et al.* (2016).

spacetime region warped by it possess this power in fundamentally distinct ways: Black holes (as all objects with mass) have the power to *produce*, to be a generative source of, the warping of spacetime. In other words, black holes can cause spacetime to warp without *themselves* needing to have something warp *them*, and to have this warp-conferring activity sustained by this prior warping. Black holes, are, in this sense, "unwarped warpers" of spacetime. They have a *productive* power to warp spacetime.

The region of spacetime warped, by contrast, has only the power to *conduct* the activity of warping. It can only *receive* the activity of warping from some extrinsic source (the black hole), and thereby *pass on* the activity of warping, in the form of gravitational waves, to something else (other regions of spacetime). Moreover, it cannot maintain its own warping activity without being sustained therein by the ongoing spacetime-warping activity of a mass. If the black hole, or any other accelerating mass, were removed from that region of spacetime, the region would quickly cease to generate gravitational waves. As David Feldbaum (2020) writes, "the sources of GWs are...superdense astrophysical objects" (p. 6). In this sense, the spacetime region is entirely impotent, *in itself*, to confer warping on anything. Spacetime is thus essentially a "warped-warper." It has only a *conductive* power to warp spacetime.

Next consider the case of a slack rope tied to a peg on one end and nothing on the other. No segment of the rope, simply in virtue of what it is, has a power to *produce* tension force in the next segment. Left to its own devices, each segment of the rope will remain slack, and by remaining slack, be entirely impotent to confer tension force on the next segment. However, if someone comes along and *pulls* the rope taut, they will thereby confer tension force on segment

1, which will thereby confer tension force on segment 2, and so on down the rope, until we arrive at the final segment tied to the peg.[45]

In this case, we can truly say of the person who pulled the rope taut that he or she has the power to confer tension force on each segment of the rope. But there is also a sense in which each segment of the rope has the power to confer tension force on the segments next to it. These senses are, however, distinct. For the person who pulls the rope taut has the power to *produce* tension force; to serve as a causal origin, or *source*, of the tension force spread throughout the length of the rope. People thus (arguably) have a productive power for conferring tension force. By contrast, the segments of the rope do *not* have the power to produce, initiate, serve as a causal origin of the conferral of tension force. Instead, they can only passively *receive*, and by receiving, *pass on* tension force. They have only, in other words, a conductive power for conferring tension force.

Finally, consider the causal activity of blood circulation. In the mammalian body, the heart has a power to *produce* circulation. Plasma and red blood cells, by contrast, cannot produce their own or anything else's circulation: they must receive their circulatory activity, and be sustained therein, from the pumping heart.[46] They can, however, *conduct* circulatory activity. Plasma circulates the red blood cells it carries throughout the body, and the red blood cells thereby circulate oxygen.[47] In this sense, both plasma and red blood cells do indeed have a

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[45] For a more detailed discussion of the conferral and transfer of tension force in a case like this, see Bettini (2019), p. 65-67.

[46] "Circulation is sustained by the rhythmic contraction of the heart: left ventricle for the systemic circulation and right ventricle for the pulmonary circulation" (Cavagna 2019, p. 109).

[47] See Cole and Kramer (2016) and Laizzo (2015).

circulatory power, but not in the *productive* sense. Instead, they can only *conduct* the circulatory activity that they themselves have received from the "uncirculated circulator": the heart.

The productive/conductive power distinction, far from being a merely theoretical artifice, thus appears to describe a number of causal relations encountered both in everyday experience and in the sciences.

Before proceeding, it's worth addressing the question of whether the productive/conductive power distinction is *exhaustive*, and whether it is *exclusive*. This question has two senses: (1) Whether a *power itself* is always either productive or conductive (exhaustive) and never both (exclusive), and (2) whether an *object* must always either possess the productive or the conductive form of the power (exhaustive) and never both (exclusive). Let's consider each sense of the question in turn.

I think it plausible that the distinction is exclusive, but not exhaustive, in the first sense. That it is exclusive is true by definition: Productive powers are defined as powers that do not require the sustaining activity of something else engaged in that very activity for their exercise; conductive powers are defined as the negation of this. They are contradictories, and so mutually exclusive. It's not plausible, however, that the distinction is exhaustive in this sense. A power could be neither productive, nor conductive, for example, if it is not a power to produce the activity, but also not a power to receive *and potentially transmit* that activity. Some powers are purely receptive or "passive," and so not productive, but they also do not empower their possessors to *transmit* the activity they receive to something else. So, for example, a non-reflective surface has the power to be illuminated, but no power to illuminate. It is thus not productive of illumination. But it is also not conductive, because, unlike a reflective surface, it cannot pass on illumination to something else.

In the second sense of the question, however, the conductive/productive distinction is I believe neither exhaustive nor exclusive. It is not exhaustive, because (of course) some objects will not have either a productive or a conductive power for a given activity φ. A rock has neither the productive power to circulate oxygen, nor the conductive power to circulate oxygen. It is also not exclusive, because one and the same object might have both a productive, and a conductive, form of the power. For example, I have both a productive and conductive power to power to push over a chair. I exercise my productive power to push over a chair when I walk over to it, and of my own initiative, push it over (say, in anger). I exercise my conductive power to push over a chair, by contrast, when I'm minding my own business, and someone comes along and forcefully pushes me over near the chair, thereby causing me to in turn push the chair over.

1.1.c. **Primary/Secondary vs. Productive/Conductive**

In my view, framing the distinction between kinds of causal power in this way is more illuminating than the medieval way of framing it, drawn from Aristotle, in terms of primary/secondary or principal/instrumental causal power. Speaking in terms of "primary" and "secondary" causes/powers lends itself to the confusion, noted in Chapter 2, that the fundamental distinction is one of *numerical* order or priority. The primary causes come "first" or are "prior" in order, and the secondary causes come "later" or are "posterior" in order. And this further lends itself to the misimpression, also noted in Chapter 2, that in deploying the principle "No secondary causation without primary causation" against infinite regress the question is begged: since a secondary cause *just is* one that comes after a first or primary. Speaking in terms of "principal" and "instrumental" causation lends itself to a similar confusion, since "principal" can

also be paraphrased as "first," and the language of instrumentality, someone might (mistakenly) object, applies only to the actions of intentional agents.

The ancient and medieval way of referring to the distinction, then, obscures the fact that the crux of the distinction is not the *order* in which these causes occur or these powers manifest.[48] Rather, it is in the *intrinsic character* of the relevant powers. Where A is a productive cause of φing and B is a conductive cause of φing, and A causes B to φ, it is not *because* A occurs prior to B that it is productive, but rather it is precisely because it is productive that it *must* occur prior to B. Conversely, it is not *because* B occurs posterior to A that it is conductive, but rather it is precisely because it is conductive that it *must* occur posterior to B. In other words, the distinction concerns the *kind* of causal power exercised, not the *order* in which it is exercised. The kind of causal power exercised determines the order, not the order the kind.

Having clarified the distinction between productive and conductive powers, we can now further clarify the medieval distinction between essentially and accidentally ordered causal series.

1.2. **Essential and Accidental Order**

As seen in Chapter 2, the scholastics distinguished between two fundamentally different kinds of causal series: what they called "accidentally" (or *per accidens*) and "essentially" (or *per se*) ordered series. In light of my framing of the primary/secondary power distinction in terms of

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[48] I am not claiming that Aristotle, Aquinas, and others understood the distinction *itself* improperly. Rather, I am simply claiming that the *language* they use often obscures what I take to be the true nature of the underlying distinction in causes/powers. Indeed, in the previous chapter I argued that many have misunderstood what Aristotle, Aquinas, and others truly meant when employing such terms, precisely because of the tendency of such language to obscure the underlying distinction.

productive and conductive power, we can now draw the distinction between *per se* and *per accidens* causal series, which is parasitic on this distinction in powers, with greater precision.

In a *per accidens* series, the members exercise the causal power definitive of the series *in a productive way*. Because of this, they *produce*, serve as a generative source of, the relevant causal activity, rather than merely *conduct* it. As seen previously, the medieval paradigm for this was a series of biological generators: A person generates a child, who goes on to generate another, who generates another, and so on. Although each person in the series exists only because of the prior generative activity of their parents, nevertheless they each exercise a productive causal power to engage in procreation: a power that can be exercised without the ongoing sustaining activity of those who generated *them* through procreation. So Frank and Wolter, unpacking this distinction in Scotus, write that "...when accidentally ordered causes are involved, although A may be dependent upon B for its original existence, B subsequently acts independently of A in its relationship to E" (1995, p. 83). In the language of productive and conductive powers, we can now add that the reason B acts independently of A is precisely *because* B is exercising a power to produce the next causal act of procreation, instead of merely exercising the power to receive and transmit a prior act of the same type. Thus, in the generation case, each caused generator, *qua* generator, is related only accidentally to its causal predecessors, since it is a productive cause of the procreative act, rather than merely a conductor of it.

By contrast, in an essentially ordered series, each member with a prior cause *does not* exercise the causal power definitive of the series in a productive way, but rather in a purely conductive way. It does not act as a source, a locus, of the relevant causal activity. Instead, as a conductor, it only engages in the relevant activity by receiving it from prior members in the series, and passing it on to posterior ones (if there are any). The paradigm here, recall, was a

series involving a person, stick, and stone, where the person moves the stone by way of the stick. In such a series the stick and stone, each of which has a prior cause, does not exercise the power to produce motion (and, in this case, they also lack such a power entirely).[49] Instead, they only conduct, only receive and potentially transmit, motion—in this case, received (ultimately) from the productive motive power of the person who picked up the stick and pushed the stone with it. Thus, each caused member of this series of movers, *qua* mover, is indeed related essentially to its causal predecessor(s). For as a mere conductor, it is precisely *in the act of moving* that it depends upon being moved by its predecessor(s).

We can define the distinction between causes ordered *per accidens* and causes ordered *per se*, then, by way of the following (where 'Φ' denotes some causal activity (moving, heating, pulling, etc.)):

Accidental Order: A series S constituted by causal activity Φ is *per accidens* iff for each member x of S with successor y and predecessor z, x causes y to Φ by exercising a productive power for Φing.

Essential Order: A series S constituted by causal activity Φ is *per se* iff for each member x of S with successor y and predecessor z, x causes y to Φ by exercising a conductive power for Φing.

Thus, in a *per accidens* series, each member is a productive cause of its effect. Whereas in a *per se* series, each member with a causal predecessor is merely a conductive cause of its

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[49] The case can be adapted to a modern scientific context: The powers are powers either to conduct motion, or to produce it, *relative to a frame of reference*. That is, in frame of reference f, the stone has no power to produce motion, but I do.

effect. It is important to note, however, that to be a productive cause of Φing is not necessarily to be a productive cause *simpliciter.* Something may be a productive cause of Φing, while itself being caused to do this by some distinct causal activity Ψ. So, for example, the heart is a productive cause of the *circulation* of red blood cells and oxygen, because it possesses a power to produce circulation (unlike red blood cells or oxygen). But the heart not a productive cause *simpliciter*, because it must be caused to engage in its circulatory activity by some non-circulatory activity: electrical signals from the SA node causing the heart to contract, for example.[50] Similarly, a person pulling a rope is a productive cause of tension in the rope, because they possess a power to *produce* this tension (unlike the rope segments). But they are not a productive cause *simpliciter*, because they must be caused to engage in this tension-conferring activity by some non-tension-conferring activity: the mental states of believing that pulling this rope seems like a good idea and desiring to pull it, neuronal signals thereby being sent to the limbs, and so on.[51] A productive cause *simpliciter* would be something that is not caused *in any sense* to engage in the activity it is engaged in.

We can now define the conception of a "first cause" that falls out from the *per se/per accidens* distinction as follows:

First Cause: Some $x_1...x_n$ are a first cause relative to a causal series S constituted by activity Φ iff (1) $x_1...x_n$ cause every other member of S to Φ, and (2) $x_1...x_n$ are a productive cause of every other member's Φing.

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[50] See Weinhaus (2015).

[51] At least on one model of intentional human action.

Having clarified these notions, we have one more preliminary issue to touch on before proceeding to the argument of the chapter: How exactly to understand the theses of foundationalism and infinitism on the theory of ground embodied in GPC.

1.3. **Foundationalism and Infinitism According to GPC**

According to foundationalism, every chain of ground must terminate in some fundamental entity or entities that ground all others in the series but are themselves ungrounded.[52] By contrast, according to infinitism, it is possible that some chains of ground descend infinitely without terminating in anything fundamental.[53] (A 'grounding chain' simply refers to any *n*-tuple of entities or pluralities thereof ordered under the grounding relation.) Because my purpose in this chapter is to see how foundationalism might be argued for within the framework of GPC, we must clarify what these positions amount to within that framework.

According to GPC, a set of entities grounds a further entity when the former cause (and causally sustain) the being of the latter, and do so in virtue of their existential causal power. It follows, then, that an entity or entities should count as *ungrounded*, or *fundamental*, just in case they do *not* have their being powerfully caused by anything else. By contrast, then, something should count as non-fundamental on GPC just in case they *do* have their being powerfully caused by something else. The following definitions thus seem apt:

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[52] See for ex. Rabin (2018, p. 38) and Bohn (2018, p. 168).
[53] See for ex. Morganti (2015), Cameron (2008), and Schaffer (2003). Note again that foundationalism does *not* rule out infinite chains of ground *tout court*. Instead, it only rules out *non-well-founded* infinite chains of ground: infinite grounding chains that never terminate in something(s) fundamental. See Chapter 1 for more on this point.

FundamentalityGPC $=_{df}$ An entity e is fundamental iff there exist no $x_1...x_n$ that powerfully cause the being of e.

Non-FundamentalityGPC $=_{df}$ An entity e is non-fundamental iff there exist some $x_1...x_n$ that powerfully cause the being of e.

We can then define foundationalism and infinitism in light of these definitions as follows:

FoundationalismGPC $=_{df}$ Necessarily, for every grounding chain S, S terminates in some $e_1...e_n$ that powerfully cause the being of every other member of S, but which have their being powerfully caused by nothing.

InfinitismGPC $=_{df}$ It is possible that, for some grounding chain S, every member e of S has its being powerfully caused by some prior member(s) of S (and so S never terminates in anything fundamental).

Note that FoundationalismGPC logically entails that every grounding chain terminates in a *first cause*, given the definition of a first cause offered above:

First Cause: Some $x_1...x_n$ are a first cause relative to a causal series S constituted by activity Φ iff (1) $x_1...x_n$ cause every other member of S to Φ, and (2) $x_1...x_n$ are a productive cause of every other member's Φing.

Foundationalism$_{GPC}$ states that every grounding chain terminates in some $e_1...e_n$ that cause every other member of S to exist, and so $e_1...e_n$ satisfy condition (1). Moreover, Foundationalism$_{GPC}$ states that nothing causes these $e_1...e_n$ to exist. It follows *a fortiori* that they exercise their existential causal power without being caused to do so by something else's existing. In other words, they are not *conductors* of existence. This implies that they are a productive cause of existence, since they could only exercise their existential power in this independent way if they possessed the power to *produce*, rather than merely to *transmit*, being. Consequently, $e_1...e_n$ also satisfy (2). Thus, Foundationalism$_{GPC}$ entails that it is necessary that every grounding chain terminates in a first cause.

With these preliminary remarks out of the way, we can now turn to consider the truth of (p1).

§2 **Premise 1 Defended**

(p1) of my argument for foundationalism is that every grounding chain is an essentially ordered causal series. I will now show how truth of this premise follows from the definition of an essentially ordered series in conjunction with truth of GPC. The definition of an essentially ordered series was as follows:

Essential Order: A series S constituted by causal activity Φ is *per se* iff for each member x of S with successor y and predecessor z, x causes y to Φ by exercising a conductive power for Φing.

The question, then, is whether it's true on GPC that every grounding chain satisfies this definition.

On GPC, a grounding chain is constituted by the activity of existing, with one thing causally sustaining the existence of another. Now consider any arbitrary member *m* of a grounding chain with a causal predecessor and successor. *m* has its existence causally sustained by its predecessor, and causally sustains the existence of its successor. Next consider that everything that is grounded is *necessarily* grounded by something or other (put otherwise, nothing is only *contingently* grounded).[54] So, *m* is necessarily grounded by something or other. It follows from this that there is no possibility of *m* causally sustaining its successor's existence without itself being sustained in this existential-causal activity by its predecessors' existential-causal activity. In other words, *m* has only a conductive power to *transmit* the activity of existing, not to *produce* or *generate* it, and so in causing the existence of its successor(s) it is exercising this conductive power—thus satisfying the definition of intermediate causes in an essential order.

But *m* was just any arbitrary member of a grounding chain with causal predecessor(s) and a successor. So, we can infer that every grounding chain satisfies the definition of an essentially ordered series: Each member of a grounding chain with predecessors and a successor has only a conductive power to cause existence.

A grounded grounder is thus like the warped region of spacetime, rather than the black hole, in the above example: Just as the initially-warped spacetime region cannot confer the

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[54] It's intuitive that being grounded or not being grounded is an essential property of a thing. This is suggested by the fact, for example, that a grounded thing can be recognized as such by recognizing that it *stands in need* of metaphysical explanation. And if it needs metaphysical explanation, then we cannot say that it might have lacked a metaphysical explanation. In that case, it would just *happen to have* a metaphysical explanation, but needs none. It's also difficult to see, if something were merely contingently grounded, why it would require metaphysical explanation in some possible worlds but not others.

activity of warping on other spacetime regions without itself being warped, and so can only transmit warping received, so a grounded grounder cannot confer the act of being on that which it grounds, but can only transmit being received from that which grounds *it.* Similarly, a grounded grounder is like the red blood cell, rather than the heart. Just as red blood cells cannot circulate oxygen throughout the bloodstream without themselves being causally sustained in their circulatory activity, so a grounded grounder cannot cause being in that which it grounds without receiving the activity of being from its predecessor(s).

That intermediate grounders act only conductively can also been seen when we reflect on Scotus's insight that secondary (conductive) causes not only cause their successors, but more strongly are *caused to cause* their successors: "...the posterior in causing depends upon the prior in causing" (1949, p. 15). A grounded-grounder's causing its groundee's being is not a causal act that originates in itself. Rather, the grounded-grounder's act of causing its groundee's being is *itself* caused by its predecessors. That is, when one grounded thing grounds another, it is not as if it receives its being from that which grounds it, and then goes on to independently exercise a causal power to cause something else's being. Rather, by definition, as something grounded, it has no such independent power: it must be causally sustained in its very causal activity of grounding by that which grounds it.

Every grounding chain, then, is an essentially ordered causal series. (p1) is true. Let's now consider the core of the argument: (p2).

§3 **Premise 2 Defended**

(p2) states that, necessarily, every essentially ordered causal series terminates in a first cause. Traditionally, as we saw in the previous chapter, this premise was defended by claiming

that an infinite regress in *per se* ordered causes would violate the principle "No secondary/instrumental causation without primary/principal causation." As Aquinas put it, "...in effects there is something that is due to the power of their principal agents, and which cannot be due to the power of the instrument, and it is this that takes the principal place in the effect.." (2011, p. 566). This principle the scholastics derived from Aristotle: "[I]t is impossible for that with which a thing is moved [the instrumental agent] to move it without being moved by that which imparts motion *by its own agency* [the primary agent]" (*Physics*, 256a21; emphasis added). Aquinas deploys this principle succinctly in his argument for a first mover in the *Summa Contra Gentiles*, writing that "if we proceed to infinity among movers and things moved, all movers will be as instrumental causes, because they will be moved movers and there will be nothing as a principal mover. Therefore, nothing will be moved" (2014, p. 90).

In light of my revised (or perhaps simply more perspicuous) understanding of the instrumental/primary power distinction as a conductive/productive power distinction, my argument will instead hinge on the principle "No conductive causation without productive causation." The argument for (p2), in light of this, runs as follows:

(2a) For every essentially ordered causal series, either it is infinite or it terminates with a first cause.

(2b) If it's possible for an infinite essentially ordered causal series to exist, then it's possible that the exercise of a conductive power does not depend on the exercise of a corresponding productive power.

(2c) Necessarily, the exercise of a conductive power depends on the exercise of a corresponding productive power.

(2d) It's not possible for an infinite essentially ordered causal series to exist. (2b, 2c)

∴ Necessarily, every essentially ordered causal series terminates in a first cause. (2a, 2d)

(2a) is trivially true once the possibility of symmetric causation is ruled out—a widely held position I simply assume here in accord with the scholastics.[55]

(2b) is a consequence of the joint definitions of an essentially ordered causal series and conductive/productive powers. In an essentially ordered series, each member with a predecessor only engages in the causal activity it is engaged in insofar as it is receiving this activity, and being sustained therein, by its predecessor(s). This is simply what the exercise of conductive power is. Every caused-cause of the activity definitive of a *per se* series is thus conductive in nature. Consequently, because every caused-cause of the activity definitive of a *per se* series is exercising only a conductive power to cause that activity, and in an infinite *per se* series *every* member is a caused-cause of the relevant activity, it follows that if such a series were possible, it would be possible that conductive powers are exercised without any dependence on something with a corresponding productive power. For no matter how far back you trace a given caused-cause's ancestry, you're met with only further conductive causes. Thus, (2b) is true: If it's possible for an infinite essentially ordered causal series to exist, then it's possible that the exercise of a conductive power does not depend on the exercise of a corresponding productive power.

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[55] "It is...impossible that in the same respect and in the same way a thing should be both mover and moved, i.e. that it should move itself. Therefore, whatever is in motion must be put in motion by another" (*ST* 1.2.3).

The substantive premise, then, is (2c): that the exercise of a conductive power necessarily depends on the exercise of a corresponding productive power. It is this premise, more than any other, upon which the entire argument of this chapter hangs. What can be said in its support?

Before offering independent arguments for (2c), it should first be said that, in all likelihood, these arguments will not convince those who do not *already* see (2c) as something close to a self-evident truth. With the principle "Necessarily, the exercise of a conductive power depends on the exercise of a corresponding productive power," we have perhaps reached philosophical bedrock.

However, even if one treats (2c) as self-evident, accepting it nevertheless has the dialectical advantage of enabling one to explain why a traditional defense of infinite causal regress is misguided: that of David Hume and his followers.

In his *Dialogues Concerning Natural Religion*, Hume famously wrote in response to those who argue that an infinite causal regress is impossible,

> In such a chain, too, or succession of objects, each part is caused by that which preceded it, and causes that which succeeds it. Where then is the difficulty? But the whole, you say, wants a cause... Did I show you the particular cause of each individual in a collection of twenty particles of matter, I should think it very unreasonable should you afterwards ask me what was the cause of the whole twenty. This is sufficiently explained in explaining the cause of the parts (1980, p. 56).

In short, Hume argues that if each member of a causal series has an explanation, then the entire series has an explanation. But in an infinite causal series, each member, by definition, has a causal explanation in its predecessor(s). So, the entire series has been explained, and there is nothing left over to account for.

In arguing thus, Hume (via Cleanthes) seems to have assumed that his anti-regress opponents accept only the generic causal principle "Necessarily, every effect requires some cause." It is then argued that this principle need not be satisfied by some *single* cause explaining *every* effect in a series, but instead can be satisfied simply by *each* effect having *some* prior cause. Which, of course, is true.

But this defense will not work for those who accept (2c)—at least when it comes to an infinite *per se* causal regress. For they are not only committed to the *generic* causal principle "Necessarily, every effect requires some cause," but also to the more *specific* causal principle "Necessarily, every effect of a *conductive type* requires some cause of a *productive type*." And an infinite causal series might satisfy the first principle, while violating the second. A *per se* ordered infinite series is just such a series. In an infinite *per se* ordered series, it would indeed be true that each member of the series has *a* causal explanation in its predecessor(s). The problem for those who accept (2c), however, is that each member of the series would still lack a complete causal explanation of the right *type*, since each member of the series would (1) be a conductive cause, but (2) lack a productive source for their causal activity. Those who accept (2c) as self-evident, then, at least have the advantage of being able to offer a principled reason for rejecting one of the most influential arguments in favor of the possibility of infinite causal regress, specifically as applied to *per se* causal regress.

Let us see, however, what can be said for (2c) beyond an appeal to self-evidence and dialectical advantage. I shall give three arguments for this premise: (1) an argument from the active/passive power distinction, (2) an argument from the intrinsic unity of conductive causes, and (3) a modal argument.

3.1. **The argument from the active/passive power distinction**

Let us begin with (1). Consider that powers often come in complementary "pairs," with one active and one passive component. Or, put differently, one "agentive" component and one "receptive" component. That powers often have this complementary, active/passive structure was central to Aristotle's metaphysics of power/potency. Psillos (2021) nicely summarizes this feature of Aristotelian metaphysics as follows:

> [According to Aristotle] powers inhere in substances and come in pairs of active and passive. They ground and explain action in the following way: substance X *acts on substance* Y because (by nature) X has the active power to Φ and Y has the passive power to be Φ-ed. Causation is then seen (at least in its first of the four modes) as production: X *brings about a change* in Y because of its active power to Φ and because of the passive power of Y to be Φ-ed (p. 50).

There is, for example, the power *to dissolve* and the power *to be dissolved*, the power *to speak* and the power *to be spoken to*, the power *to burn* and the power *to be burned*, and the power *to move* and the power *to be moved.* And between such power pairs, the manifestation of the passive component causally depends, in every case, on the manifestation of the active component. The notion of something being dissolved with nothing doing the dissolving is incoherent; similarly for the notions of something being burned without anything doing the burning, someone being spoken to without someone doing the speaking, and something being moved without something doing the moving.

Also unpacking the Aristotelian conception of causal powers, Anna Marmodoro writes that "powers have other powers as their manifestation partners...the solubility of salt requires that salt be placed in solvent in order for it to dissolve (2017, p. 65), and "A's power (p) to heat

requires B's capacity (p′) to get hotter, where B is in sufficient proximity to A with nothing in the way, in order for A to be able to achieve its manifestation, that is, heating" (Ibid., p. 66).

We may reasonably infer the principle, then, that it is impossible for the passive component in a power-pair to manifest without causal dependence on the manifestation of the active component.[56] But now consider that conductive powers are, in a sense, simply a *special case* of the passive component in a complementary power pair, with the productive power corresponding to the active component. To see this, consider four of our paradigmatic cases.

The active power *to confer tension force* has, as its complement, the passive power *to have tension force conferred.* We have an active, agentive component, and a passive, receptive component. The power of the person pulling the rope taut corresponds to the active component, the power of the rope segments being pulled taut corresponds to the passive component. Each rope segment's conductive power to confer tension force *just is* its passive power to *have tension force conferred on it*, described in terms of the incidental effect this passive reception of tension force sometimes has: the transmission of that force to adjacent attached segments.

Similarly, the active power *to warp* has, as its complement, the passive power *to be warped.* We have an active, agentive component, and a passive, receptive component. The black hole's power corresponds to the active component, and the spacetime region's power corresponds to the passive component. The spacetime region's conductive power to warp other regions *just is* its passive power *to be warped*, described in terms of the incidental effect this can

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[56] There is also a more generic, existential dependence between the active and passive components that is symmetric: the existence of a dissolving depends on the existence of a being-dissolved, and conversely; the existence of an illuminating depends on the existence of a being-illuminated, and conversely; and so on. The *causal* dependence, however, is asymmetric: it is the act of dissolving that causes the act of dissolution, not the act of dissolution that causes the act of dissolving; the act of illuminating that causes the act of being illuminated, not the act of being illuminated that causes the act of illuminating; and so on.

sometimes have: when the passive activity of being warped thereby transmits warping to other regions, in the form of gravitational waves.

The active power *to circulate* moreover, has, as its complement, the passive power *to be circulated.* We have an active, agentive component, and a passive, receptive component. The power of the heart corresponds to the active component, the power of red blood cells (or plasma) to the passive component. The language of passivity is even used in some scientific contexts of blood circulation vis-à-vis the heart, as in Laizzo (2015):

> ...blood flow through all organs can be considered as somewhat passive and occurs only because arterial pressure is kept higher than venous pressure via the pumping action of the heart (p. 5).

A red blood cell's conductive power to circulate therefore *just is* its passive power *to be circulated*, described in terms of the incidental effect this passive power has when, for example, an oxygen molecule is attached to it, and is thereby circulated in turn.

Finally, the active power *to pull* has, as its complement, the passive power *to be pulled.* The power of the locomotive corresponds to the active component, the power of the boxcars to the passive component. A boxcar's conductive power to pull other boxcars *just is* its passive power *to be pulled*, described (once again) in terms of the incidental effect this passive power has when another boxcar happens to be attached to it while it is being pulled.

But though the active/passive distinction, and its application to the productive/conductive distinction, is plausible, it's worth noting that it's implausible *all* power pairs have one objectively (and exclusively) active and one objectively (and exclusively) passive component, though many, such as the above, do. Some power pairs instead seem to be perfectly reciprocal, in that they can both be viewed as equally active, or equally passive. Two books holding each other

up at an angle, each (as it were) forming two sides of a triangle, is perhaps such a case. $Book_1$ has a power to hold $Book_2$ up at the relevant angle, and $Book_2$ has a power to hold $Book_1$ up at that same angle. They each hold each other up simultaneously. But which has the active, and which the passive, component? It's unclear. Both books appear to act simultaneously as both active 'holders-up' and passive 'held-up.' Perhaps the relation between two electrons repelling one another has the same reciprocal structure. $Electron_1$ repels $electron_2$, and conversely. Which is the active repeller, and which the merely passive recipient of repelling? There is no clear answer to this question.

Despite such cases, however, it does seem clear that an objective active/passive distinction is present in *some* power pairs. When a fire burns up a piece of paper, it is clear that, with respect to the specific activity of burning, it is the fire that is the active agent of the burning, and the paper the merely passive recipient of the fire's action. The fire is *burning*, the paper *being burnt.* When a boulder crushes a small shrub, it is clear that, with respect to the specific activity of crushing, it is the boulder that is the active agent of the crushing, and the small shrub the passive recipient of the boulder's crushing action. The boulder is *crushing*, the shrub *being crushed.* And when a knife cuts a cake, it is clear that, with respect to the specific activity of cutting, it is the knife that is the active agent of the cutting, and the cake the passive recipient of knife's cutting action. The knife is *cutting*, the cake *being cut.* In all such and similar cases, it seems implausible to think the active/passive distinction in the relevant powers exercised has no basis in objective causal reality.

At this point, however, the following objection might be raised: Do not what I am calling the "active" components in a power pair *also* generally receive their activity from something else? After all, flashlights must be turned on in order to produce illumination, locomotives must

be started in order to produce motion, hearts must receive an electrical impulse in order to pump, and so on. But if this is true, it seems to follow that both productive and conductive powers, both the active and the passive components in a power pair, depend for their causal activity on receiving it from something prior. But then the distinction breaks down, and the very infinite regress I am attempting to avoid reemerges: conductive powers must indeed be traced to a manifestation of what I am calling "productive" powers, but these productive powers *themselves* must also receive their activity from something prior, and so are "passive" relative to those causes, and so on, *ad infinitum.*

The problem with this objection is that it fails to appreciate, as mentioned in §1.2, that for *x* to be a productive cause of Φing does not mean that *x* has no cause whatever of its Φing. Rather, it simply means that *x* is a generative source of a particular case of Φing, rather than merely participating in, or receiving, something else's act of Φing. And this can be the case even if *x* is triggered to engage in this activity by something else engaged in some *distinct* activity.

So, for example, although I might have to turn on the flashlight in order for it to produce illumination, it's nevertheless the case that the flashlight does not *receive* illumination from me, as (say) a mirror would from the flashlight. Rather, I simply cause it to manifest its *own* independent power to generate illumination. Similarly, although a train conductor might have started up a locomotive, it's nevertheless the case that the locomotive does not *receive* its motion from the conductor's motion. Rather, the conductor simply causes the locomotive to manifest its own independent power, as the kind of electro-mechanical system that it is, to generate motion.

In short, this objection fails because *to be caused* to engage in an activity is simply not the same as *to receive* that activity. Every reception of an activity is of course a case of being caused to engage in that activity, but not every case of being caused to engage in an activity is

thereby a reception of it. And the question of whether a *per se* infinite series is possible is the question of whether there is some productive, some non-conductive, source for the activity definitive of the series. It is *not* the question of whether that productive source itself has *any cause at all* of its productive activity.

With this objection answered, and keeping in mind the clarification that not *all* power pairs have this strict active/passive structure, we can conclude that conductive powers specifically are just a particular species of passive power: those which, once their possessor has received the relevant activity from something with the productive form of the power, can pass the same activity on to something else. And if this is so, like all passive powers, they require their active, productive, complement in order to manifest. This is further suggested by the fact that, properly speaking, it seems more accurate to describe (say) a red blood cell not as having the power *to circulate* full-stop but rather *to be circulated* and *thereby to circulate*. Similarly, it seems more accurate to describe spacetime not as having a power *to warp something* full-stop, but rather *to be warped by something* and *thereby to warp something else.* Things with the conductive form of a power are simply the passive complement to the power's active (productive) form, and they transmit the activity precisely by being passive recipients of it.

To sum up, we have the following argument in favor of (2c):

1) Productive powers are active powers and conductive powers are passive powers.

2) Necessarily, the exercise of a passive power depends on the exercise of a corresponding active power.

∴ Necessarily, the exercise of a conductive power depends on the exercise of a corresponding productive power. (1, 2)

3.2. **The argument from the intrinsic unity of conductive causes**

Let's now consider an argument for (2c) from the intrinsic unity of conductive causes. To begin, recall from the previous chapter that, according to Scotus, in a *per se* ordered causal series the instrumental causes have the following feature: they not only cause their successors, but they are *caused to cause* their successors. In the Subtle Doctor's own words, "...the posterior in causing depends upon the prior in causing" (1949, p. 15). But what, exactly, does it mean for one thing to depend on another in its very act of causing?

Here recent work by Gaven Kerr (2012; 2015) has been highly illuminating. Kerr (2012), in the course of unpacking Aquinas's argument for a first cause of being in the *De Ente et Essentia* (*On Being and Essence*), points out that we can represent the distinction between a *per se* and *per accidens* causal series in the following way (where the variables are the causal relata, and the arrow is the causal relation):

Per Accidens: (...) ^ ($v \rightarrow w$) ^ ($w \rightarrow x$) ^ ($x \rightarrow y$) ^ (...)[57]

Per Se: (...) $\rightarrow$ ($w \rightarrow$ ($x \rightarrow$ ($y \rightarrow z$)))

In the *per accidens* series, v causes w, w then independently causes x, x then independently causes y, and so on. Each causal act is independent of all others, because w's own causal nature is sufficient to produce x, x's own causal nature is sufficient to produce y, and so on. By contrast, in the *per se* series, each causal act is *not* independent in this way. Take, for example, the causal

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[57] I have replaced the arrows between causal relata with the conjunction symbol since I think it more accurately represents Kerr's thought. Including the arrow lends itself to the confusion that the *per accidens* series, like the *per se* series, involves second-order causation.

relation between *y* and *z*. This causal relation is not independent of the causal relations prior in the series. Rather, the very act of *y* causing *z* is itself an effect of *w* causing *x* and thereby causing *y* to cause *z*. In this way, each causal predecessor in a *per se* series is a "second-order" cause of the next causal act in the series: it causes the causation of its successor.

To illustrate, consider the relationship between a ceiling beam, a chain connected to the beam, and a chandelier connected to the chain. In this causal series, the ceiling beam does not merely cause the chain's suspension, which then independently causes the chandelier's suspension. (Like, for example, I might release a balloon with a string tied to it with a coin taped to the string, in which case I do not *cause the balloon to cause* the coin's suspension off the ground, but merely trigger the balloon's independent power to do so.) Rather, the ceiling beam *causes the chain to cause* the chandelier's suspension; the ceiling beam causes the chain's suspension *and thereby also causes* the suspension of the chandelier. Or consider again the relationship between the person pulling the rope taut and each segment of the rope. In this causal series, the person does not merely cause segment 1 to experience tension force, which then goes on to independently cause segment 2 to experience tension force, and so on. (Like, for example, might occur if someone pulls my arm, making me decide to go and pull someone else's arm, and so on, in which case each person acts as an independent, productive cause of the tension force conferred on the next person's arm.) Instead, the person *causes segment 1 to cause segment 2 to cause segment 3 to cause...segment n* to experience tension force.

Now, the fact that causes ordered essentially have this structure has the following important implication: that the intermediate causes (caused-causes) in a *per se* series always have the nature of a *single effect.* In other words, they are *intrinsically unified*, forming a single overall act. As Kerr writes,

> The [*per se*] series is not a successive series, but rather a *single action* constituted by a number of causal relata related as outlined above. Thus, the mind's movement of the hand   is not a single event, nor is the hand's movement of the stick, nor the stick's movement of   the stone. Rather, the *single event* is the mind's movement of the stone by means of the   hand and the stick. On the other hand, the [*per accidens*] series is a series of successive   acts: namely, acts of procreation in the fathers-sons series (2015, p. 140; emphasis added).

But the intermediate members in a *per se* series, we saw, are all conductive causes. This is precisely what *makes* a series *per se*. And what *this* implies is that any series of causes related by conductive causation has the nature of a single, unified effect. Let's unpack this idea further.

Where *x* conductively causes *y*, *x*'s causing of *y* has the nature of a single effect; an effect we can refer to as "*x*'s being caused to cause *y*." The same applies to any number of causes related conductively. Where *x* conductively causes *y*, and *y* conductively causes *z*, for example, the relation between *x*, *y*, and *z* has the nature of the following single unified effect: "*x*'s being caused to cause *y*'s causation of *z*." This again is distinct from what obtains in a *per accidens* series, where, because each causal relation is productive rather than conductive, the various effects forming the series cannot be unified in this way. That is, in a *per accidens* series, where *w* causes *x*, and *x* independently causes *y*, *x* and *y* are each entirely independent effects of distinct causes. By contrast, in a *per se* series, where *x* is caused to cause *y*'s causation of *z*, "*x* being caused to cause *y*'s causation of *z*" is a single, unified effect. Much in the same way that, for example, "picking up the bucket and thereby picking up the water" is a single unified effect that I might produce, unlike "picking up the bucket, and then picking up the water," which would be two distinct effects of two distinct acts.

In the ceiling-chain-chandelier series, for example, we cannot fully capture the nature of the series by simply pointing to the pair of causal relations "the ceiling beam suspending the chain" and "the chain suspending the chandelier." This way of putting things is accurate as far as it goes, but leaves out something crucial: that the total effect of the ceiling beam is not simply its causing of the chain's suspension, but more fully is its *causing the chain's suspension and thereby also causing the chandelier's*. Similarly, the "pair-wise" description leaves out the fact that the cause of the chandelier's suspension is not simply the suspending activity of the chain, but rather more fully the ceiling beam's *causing the chain to cause* its suspension.

Or consider again the series formed from the locomotive pulling the boxcars behind it, thus causing their forward motion. In such a series, it's not as if all we have is a series of discrete effects, each of which can be satisfactorily accounted for by their most proximate causes: the locomotive causing the motion of $boxcar_1$, $boxcar_1$ causing the motion of $boxcar_2$, $boxcar_2$ causing the motion of $boxcar_3$, and so on. Instead, we have a single unified effect formed by the conductive causes, all flowing from a single productive source: the locomotive causing the motion of $boxcar_1$ which thereby causes the motion of $boxcar_2$ which thereby causes the motion of $boxcar_3$, and so on.

This point about conductive causes forming unified effects can be used to argue for (2c) in the following way: If causes ordered conductively have the nature of a single effect, then *there must be some cause of this single effect*. The cause of this effect cannot simply be further conductive causes, for these would simply constitute further components of *a larger, overall effect*—an overall "being caused to cause." Thus, there cannot be a causal series constituted only by conductive causes, no matter its length, for this would imply the existence of an effect without any cause. In such a series one would only ever encounter more causes that are "caused to

cause," but nothing that *causes the causation* of *everything* in the series. The caused-causality of every member of the series must be accounted for. We have seen that further conductive causes cannot do the trick, so we must appeal to some other kind of cause.

As we saw in section 1.1.b, it's plausible that if the power involved in an act of causation is not conductive, it is either (1) productive, or (2) purely receptive (that is, passive and non-transmissive). By definition, the power exercised in causing a series of conductive causes cannot be the latter, because if it were, it would, *contra* the concept of a purely receptive power, be receiving the activity from something else and passing it on to all the conductive causes. It would, in short, simply be another conductive (passive and transmissive) cause, which we have just ruled out as being the cause of the causation of a total series of conductive causes, which form a single effect. It must, then, be a productive cause. Only a productive cause could serve as the cause of a collection of conductive causes without being subsumed into the total effect that such a collection constitutes.

We can summarize this second argument for (2c) as follows:

1) For any series of conductive causes, those causes together constitute a single unified effect.

2) Necessarily, every effect requires a cause.

3) Necessarily, any series of conductive causes require a cause. (1, 2)

4) Necessarily, the power exercised in a case of causation is either conductive, purely receptive, or productive.

5) The power exercised in the causation of an entire series of conductive causes can neither be conductive nor purely receptive.

6) Necessarily, the power exercised in the causation of any series of conductive causes must be productive. (3, 4, 5)

∴ Necessarily, the exercise of a conductive power depends on the exercise of a corresponding productive power. (6)

3.3. **The modal argument**

Finally, we can give a *modal* argument for (2c). Note first that our discussion has assumed, because GPC assumes, the truth of a powers-theoretic account of causation. It is only natural, then, that those inclined to adopt GPC might also be inclined to adopt a powers-theoretic account of *modality*. In particular, the powers-theoretic account of possibility defended in recent years by, for example, Pruss (2002), Williams and Borghini (2008), Jacobs (2010), and Vetter (2015).[58] According to this modal theory, facts about possibility are made true by facts about the powers (or "dispositions," "potentialities") of actually existing objects, just as facts about causation are made true by the exercise of various powers. In short, any proposition of the form "*p* is possible" is made true by something(s) existing with a power to bring it about that *p*.[59]

Some will surely object to this theory, but then such persons would also likely object to the powers-theoretic account of causation and grounding upon which my project is built. I do not address myself to such persons, but only to those positively disposed towards an ontology of powers and its theoretical benefits. With that said, let us see how this powers theory of possibility might be employed to defend (2c).

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[58] For an overview of the powers-theoretic approach to modality, see Vetter (2011).

[59] Or something existing with a power to bring something else into existence that possesses the power, or existing with a power to bring something else into existence with a power to bring something else into existence with the power, etc. For more on such "iterated" potentialities, see Vetter (2015).

Consider the possibility that something engages in activity Φ. On the powers theory, this possibility must be explained by that fact that something(s) exists with a power to bring it about that something Φs. We now ask whether the power that explains this possibility is conductive, purely receptive, or productive. It cannot be the conductive because, by definition, possessing a conductive power for an activity is insufficient for engaging in that activity, precisely because conductive powers merely *receive* and *transmit* that causal activity, rather than *producing* it. In other words, conductive powers cannot *bring about* the activity they are for, *per* the requirement of the powers theory of possibility, but rather can only receive and potentially transmit it once it has *already* been brought about. Similarly, the power that explains the possibility cannot be purely receptive, simply because a receptive power is a power *to be Φ'd*, not *to Φ.* It thus appears that, assuming a powers theory of possibility, only productive powers can explain possibilities for a given activity.[60]

At this point, however, the following objection might be leveled. It might be objected that the powers theory of possibility does not commit one to the view that the powers that explain possibilities must *suffice* for the given activity, but rather only that they are *for* that activity simpliciter.[61] As long as (for example) something has the power to heat *full-stop*, no matter the character of that power, whether conductive or productive, the possibility that something heats is explained.

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[60] It is noteworthy that this suggests the standard formulation of the powers theory of possibility might require revision, along the following lines: "*p* is possible just in case there exists something(s) with a *productive* power to bring it about that *p*." On the other hand, it might be that the phrase "bring it about that" (or "make it the case that") already implicitly implies productive power, as I suggest in the text above, since conductive powers do not "bring it about" or "make it the case" that a certain activity manifests, they only receive and transmit that activity once something else (a productively empowered object) has *already* manifested the activity. (Thanks to Barbara Vetter for bringing this issue to my attention.)

[61] I am similarly indebted to Barbara Vetter for raising this potential objection, and for helpful suggestions in resolving it.

This, however, is undermined by reflecting on some hypothetical cases. If, for example, the world contained only reflective surfaces (mirrors, etc.) but no stars, flames, lightning, or other potential producers of illumination (and nothing that could bring such illumination-producers about), it does not seem that something actually being illuminated would be possible. The fact that there exist reflective surfaces, equipped only with conductive power for illumination, seems clearly insufficient for the possibility that something is illuminated. It is only if something is equipped with a power to *produce* illumination, that any actual case of illumination can obtain. The manifestation of productive powers can, in a sense, be thought of as the "raw material" that conductors require to work with. An activity must be *given* to a conductive cause, such as a mirror vis-à-vis illumination, in order for that cause to receive and pass on that activity. But where there are no producers of an activity, there is nothing that can be *given* to conductors of that activity, no matter how many there be, and so nothing that can be *received* and *transmitted*. Conductive powers for illumination, then, are simply insufficient for the possibility that something is illuminated.

Similarly, consider a world in which there exists only spacetime, but nothing with mass, and nothing which could bring about anything with mass. In such a world, there would exist nothing with a productive power to warp, and only things (spacetime regions) with a conductive power to warp. As in the previous case, it seems clear that there would be no possibility of any region of spacetime being warped in such a world. Spacetime cannot warp itself; it requires objects with mass to do the warping. The fact that regions of spacetime *if they are first warped* by something else can go on to warp other regions is entirely insufficient, in this massless world, to make it possible that any region of spacetime is warped. By contrast, if there *were* productive warpers, as there are in our "mass-full" world, something actually engaging in the activity of

warping would indeed be possible. That which possesses a productive power to warp, such as a black hole or neutron star, can impart that warping activity to the potential conductors of it (regions of spacetime) that are entirely insufficient, in themselves, to manifest it. But where there is nothing to impart warping, nothing can transmit it. Similar examples could be multiplied, and they all seem to support the intuition that having *any* power for an activity is not enough for the possibility that such an activity manifest, but rather only *productive* powers for the activity suffice.

That only productive powers can explain the possibility that an activity manifest can be strengthened if we recall the close connection between productive/conductive powers and active/passive powers. Imagine a world containing only things that are water-soluble (salt, sugar, etc.), but no water, and nothing that could bring water into existence. Now consider the possibility that something actually be dissolved in water. Is this a possibility in such a world? It seems not. At least, it is not what we might call a "live" or "real" possibility, and is at best a mere a simulacrum thereof. And this is simply because, as noted above, every passive power in a power pair essentially depends for its manifestation on the manifestation of the corresponding active power. There is no possibility of *being dissolved* where nothing exists that can actively *dissolve.* But as we saw above, conductive powers are simply a special case of passive power, and productive powers are active powers. Consequently, if we admit that it's impossible for passive powers to manifest without a corresponding active power, we must also admit that it's impossible for conductive powers, which are essentially passive, to manifest without a corresponding productive power, which is essentially active. It follows that purely conductive powers for an activity cannot explain the possibility that this activity manifest.

Now consider that, if the possibility that a conductive power manifest must be explained by the existence of something with a corresponding productive power, it follows that the *exercise* of a conductive power must depend upon the *exercise* of the productive power that explains its possibility. For if a conductive power could manifest *without* dependence upon the manifestation of the productive power that explains its possibility, it's not clear why the productive power should be relevant to the possibility of the conductive power's manifestation at all. Indeed, it is precisely *because* we intuitively recognize that conductive powers cannot suffice for the activity they manifest that we recognize they must "borrow" this activity from something that *does* suffice for it: a corresponding productive power.

We can summarize this fourth and final argument for (2c), then, as follows:

1) Necessarily, p is possible iff something(s) exists with a power to bring it about that p.

2) For some arbitrary conductive power P, it is possible that P manifests.

3) Some $x_1...x_n$ exists with a power P^* to bring it about that P manifests. (1, 2)

4) P^* is either conductive or productive.[62]

5) P^* cannot be conductive.

6) P^* is productive. (4, 5)

7) For all conductive powers P, necessarily, it is possible that P manifests iff something exists with a productive power to bring it about that P manifests. (1-6)

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[62] Recall that there is no third possibility here, because non-productive, non-conductive powers are those which are purely receptive, and they are not powers to cause an activity in any sense, but simply to receive it.

8) If for all conductive powers *P*, necessarily, it is possible that *P* manifests iff something exists with a productive power to bring it about that *P* manifests, then necessarily, the exercise of a conductive power depends on the exercise of a corresponding productive power.

∴ Necessarily, the exercise of a conductive power depends on the exercise of a corresponding productive power. (7, 8)

§4 **Conclusion**

Let's take stock. My argument for foundationalism, in the context of my theory of ground as powerful, existential causation ('GPC'), ran as follows:

(p1) Every grounding chain is an essentially ordered causal series.

(p2) Necessarily, every essentially ordered causal series terminates in a first cause.

∴ Necessarily, every grounding chain terminates in a first cause (ungrounded grounder).

(p1) followed from the joint definitions of grounding according to GPC and of an essentially ordered causal series. According to GPC, grounding chains are causal chains. An essentially ordered series is one in which each caused-cause is merely a conductive cause. A grounded grounder, understood causally, satisfies the definition of a conductive cause: it has no power to produce the being of that which it grounds, and instead merely receives and transmits being from its predecessor(s). Like all conductive causes, grounded grounders must be sustained in their causal activity by that which grounds/causes them. Thus, grounding chains constitute essentially ordered causal series.

(p2) was then defended by way of the following sub-argument:

(2a) For every essentially ordered causal series *S*, either (a) *S* is infinite, or (b) *S* terminates with a first cause.

(2b) If it's possible for an infinite essentially ordered causal series to exist, then it's possible that the exercise of some conductive power does not depend on the exercise of a corresponding productive power.

(2c) Necessarily, the exercise of a conductive power depends on the exercise of a corresponding productive power.

(2d) It's not possible for an infinite essentially ordered causal series to exist. (P2, P3)

∴ Necessarily, every essentially ordered causal series terminates in a first cause. (P1, P4)

(2a) is trivially true. (2b), we saw, follows from the concepts of an infinite essentially ordered causal series and the conductive/productive distinction. The controversial premise, then, was (2c). I defended this premise by way of three sub-arguments: (1) an argument from the active/passive power distinction, (2) an argument from the intrinsic unity of conductive causes, and (3) a powers-theoretic modal argument.

If even one of these arguments is sound, then (2c) is true. And if (2c) is true, then assuming (2a) and (2b) are as well, my argument for (p2) in the original argument for foundationalism goes through: we can conclude that, necessarily, every essentially ordered causal series terminates in a first cause. And along with (p1) in that original argument, we arrive at the conclusion that, necessarily, every grounding chain terminates in a first cause (ungrounded grounder). I.e., we arrive at the truth of foundationalism

If my reasoning here is plausible, then understanding ground as a kind of causal relation—specifically, as powerful, existential causation—provides fresh resources for making the case against infinitism, and for foundationalism. It allows us to draw from the rich metaphysical tradition of medieval philosophy to show that a first cause of being must exist. Whether those philosophers were right about the identity of this first cause, however, I leave for future work.

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