Canadian Journal of Philosophy (2022), 52: 5, 517–539
doi:10.1017/can.2022.41

ARTICLE

In Leibniz's Wake: Rationalist Paradise Lost

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Abstract
The eighteenth-century German rationalist tradition is, broadly speaking, committed to (what I call) 'the principle of rational cognition': the grounded must be rationally cognizable from its sufficient ground. Whereas the prevailing view takes the fundamental challenge to rationalist paradise to stem from the principle of sufficient reason, I argue that it instead stems from this principle: How is it possible to rationally cognize anything at all from its ground? By investigating the opposing responses of two of Leibniz's most influential immediate successors, Christian Wolff and Christian Crusius, we find no easy way to remain in rationalist paradise.

Keywords: Rationalism; Leibniz; Wolff; Crusius; cognition; ground; reason

1. Introduction

Human beings incessantly seek explanation; we ask *Why* and search for a *Because.* We might ask: Why did the Big Bang happen? Why is anything possible at all? Why are you reading this? In its most ambitious form, 'metaphysical rationalism' (as we might call it) entails that this search for explanation is never in vain. Its commitment to the principle of sufficient reason (the PSR) guarantees that everything has a sufficient reason, or ground. As Leibniz, one of the greatest proponents of rationalism, says in the *Principles of Nature and Grace*:

> So far we have just spoken as simple *physicists*; now we must rise to *metaphysics*, by making use of the *great principle*, little used, commonly, that *nothing takes place without sufficient ground* [*raison*], that is, that nothing happens without it being possible for someone who cognizes [*connaître*] enough things to give a ground sufficient to determine why it is so and not otherwise. (AG 209; translation modified).

The purported scope of the PSR—that *everything* has a sufficient ground—has received much attention. But what is it *to be* a sufficient ground for the rationalist? The PSR presupposes some notion of ground; it does not establish this notion.[1] I will argue that the distinctively rationalist characterization of this notion advanced by Leibniz and two of his most influential German rationalist successors, Christian Wolff (1679–1754) and Christian Crusius (1715–1775), precipitates a foundational crisis that threatens the possibility of anything having a ground at all.[2]

[1]As Heidegger (1929) astutely observes in *On the Essence of Ground*: "Yet what constitutes the essence of ground is not determined *in* this principle [of sufficient reason]. This [essence] is *for* this principle presupposed as a self-evident 'representation' [*selbstverständliche 'Vorstellung'*]" (9; my translation).

[2]A few terminological notes. The term 'rationalism' is sometimes used to designate doctrines that do not concern grounds, e.g., the doctrine that there are innate ideas. Such uses of the term will not be at issue here. I will also treat 'ground' and 'reason' as synonyms here. These terms [*L: ratio*; *F: raison*; *G: Grund*] are generally used synonymously by these philosophers. I will also follow them in using 'consequence' [*L: consequentia* or *rationatum*; *F: conséquence*; *G: Folge*] to refer to *what is grounded.* The

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Leibniz attributes two distinct roles to grounds above. First, he attributes a *metaphysical* role: a sufficient ground provides *that in virtue of which* something else holds (it "determines why it is so and not otherwise"). For instance, a body obtains in virtue of its parts; its parts jointly bring about its compositional and geometric features (such as its shape). Second, Leibniz attributes a *cognitive* role to grounds. For anything that has a sufficient ground, it must be (in principle) possible to cognize it from its sufficient ground; it must be "possible for someone who cognizes [*connaîtrait*] enough things to give a ground sufficient to determine why it is so and not otherwise." By cognizing something from its ground, our reason cognizes not merely *that* it is the case, but *why* it is the case. For instance, whereas the senses might reveal *that* a body has a certain shape, rational cognition of a body's shape from its ground (say, in the organization of its parts) reveals *why* it has that shape. By playing this cognitive role, a ground satisfies the rationalist's core demand for reality's intelligibility or explicability.

The 'principle of rational cognition' (as I will call it) says that this cognitive role is a prerequisite for being a (sufficient) ground at all. A bit more formally:

> **Principle of Rational Cognition:** entity α is a sufficient ground of entity β only if β is rationally cognizable from α.[3]

Without the principle of rational cognition, the PSR leaves open that grounds bring about their consequences in an unintelligible way. Only when the PSR is taken to presuppose the principle of rational cognition do the gates open to 'rationalist paradise': a conception of reality fully intelligible or explicable to reason—in which everything has a ground from which it can be rationally cognized. In rationalist paradise, every *Why* posed by reason admits of an intelligible *Because*; the great chain of being runs hand in hand with the great chain of cognition. Rationalist paradise therefore bends to the rationalist demand for reality's intelligibility; her philosophy subsequently aims to detail this intelligible structure.[4]

Yet it is widely held that Leibniz and his German rationalist successors are threatened with eviction from rationalist paradise. What precipitates this threat? Proponents of the prevailing narrative suppose that the PSR is the core rationalist doctrine about grounds; the principle of rational cognition's significance is to be subsumed under the PSR's. Consider Della Rocca's (2013) description of metaphysical rationalism:

> This form [of rationalism—JS] is the commitment to the intelligibility of the world and of all the things in the world. On this view, the world and the things in the world are through and through intelligible. Nothing happens for no reason. On the contrary, whatever takes place, whatever takes place, whatever exists, takes place or exists for a reason. Everything. On this view there are no brute facts. Each thing that exists has a reason that is sufficient for explaining the existence of the thing. (2)[5]

Proponents of the prevailing narrative accordingly maintain that the threat of eviction primarily stems from some challenge to the PSR. They disagree about the precise nature of the challenge, e.g., whether it concerns some implication of the principle or its very basis. For instance, on Hogan's

works of Wolff and Crusius have remained largely untranslated—all translations of their works below are my own (unless noted otherwise). All translations of Leibniz that are not from Ariew and Garber's translation (Leibniz 1989 [AG]) are my own; the original works can be found in Leibniz (1875–90 [G]) and (1923 [A]).

[3]Leibniz characterizes many kinds of entities as grounds—including things, events, states of affairs, propositions, and truths. *Cf.* AG 19, AG 209, AG 217, and G VII 419. *Mutatis mutandis* for his German rationalist successors. Hence my framing of the principle in terms of entities.

[4]More below on whether the principle is to be relativized to our (finite) intellects or to an infinite intellect (such as God's).

[5]*Cf.* Watkins (2005, 170); Della Rocca (2008); Lin (2012); Hogan (2013, 274–75); Dasgupta (2016); and Look (2018).

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(2009) version of the prevailing view, the principal challenge involves the PSR's foreclosing of (libertarian) freedom. By contrast, Boehm (2014) suggests that the challenge involves the PSR's Spinozistic implications. Or, per Watkins (2005) and Anderson (2020) (among many others), the challenge involves Humean scruples about our cognition of the PSR itself. But proponents of the prevailing narrative all agree that the principal challenge concerns the PSR; it concerns whether absolutely *everything* has a sufficient ground.

I do not deny that Leibniz and his German rationalist successors grapple with such challenges to the PSR. Yet my central thesis is that sustaining the principle of rational cognition poses a more fundamental challenge for these figures. The challenge is this: regardless of whether everything has a ground, how it is possible for anything at all to be (or have) a ground that satisfies the principle of rational cognition? That is, under what conditions is rational cognition from grounds possible; just from cognition of a ground, how is it possible to rationally cognize its consequence? A challenge to the PSR might lead us to doubt (or even deny) that *absolutely everything* has a sufficient ground. By contrast, because this challenge to the principle of rational cognition concerns a prerequisite for something to be a ground, it threatens how *anything at all* has (or is) a ground. In effect, whereas a challenge to the PSR might lead us to exclude certain things from rationalist paradise, this challenge to the principle of rational cognition threatens to dissolve the very adhesive that binds everything in rationalist paradise together. In precisely this sense, the latter challenge is more fundamental.

Our investigation will outline how this challenge unfolds for Leibniz and subsequently prompts a cognitive turn in metaphysics among his successors. In the first part of our investigation, we will see that addressing this challenge pressures Leibniz to concede that grounds necessitate their consequences. Without being necessitated by its ground, something could not be rationally cognized from its ground. Addressing this challenge therefore comes to stand or fall with the nature of these necessary connections and our rational cognition of them. The challenge accordingly leads to the following dilemma. On the first horn, all necessary connections (insofar as they are rationally cognizable) are *logically* necessary; they all hold on pain of contradiction (the logicist horn). On the second horn, some of these necessary connections are *nonlogically* necessary; such connections do not hold on pain of contradiction (the antilogicist horn).

Leibniz's considered response to the dilemma is up for interpretative debate; I will not try to settle it here. But the dilemma does not die with him. In the second part of our investigation, I will reconstruct Wolff's case for embracing the logicist horn and Crusius's (largely neglected) incisive criticisms of it. In the third part, I will scrutinize Crusius's embrace of the antilogicist horn. As we will see, their opposing responses mark a *cognitive turn* in metaphysics—a turn characterized by (i) the axiomatization of principles that capture how rational cognition from grounds is possible (accompanied by the demotion of the PSR to a derivative principle) and (ii) a basis for cognition of these axiomatic principles within the nature of our cognitive faculties. But I will tentatively conclude that their opposing responses reveal no easy way to sustain the principle of rational cognition. In brief, whereas Wolff's logicist rationalism seems susceptible to Crusius's criticisms, Crusius's antilogicist rationalism seems susceptible to paradox. The threat of eviction from rationalist paradise remains.

In section 2, I sketch how Leibniz's connection between rational cognition and necessitation generates the dilemma of rational cognition. In section 3, I outline how Wolff's cognitive turn in metaphysics runs alongside his embrace of the logicist horn of the dilemma. In section 4, I detail Crusius's neglected criticisms of the logicist horn and his subsequent embrace of the antilogicist horn. In section 5, I argue that paradox looms over Crusius's antilogicist rationalism. In section 6, I conclude by briefly touching upon the dilemma's Kantian aftermath.

Our investigation is not a postmortem of a dead philosophical issue. Many contemporary metaphysicians have alleged that a central aim of metaphysics is to establish what grounds what. But how is it possible to establish what grounds what? Some metaphysicians have suggested that establishing this requires being able to grasp the grounded from its sufficient ground—precisely as

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the principle of rational cognition states.[6] Nonetheless, these metaphysicians have done comparatively little to explain how something can be grasped from its ground. The eighteenth-century German rationalist tradition inaugurated by Leibniz illuminates challenges that await.

2. Leibniz and the dilemma of rational cognition

Leibniz's thinking about grounds was not static. For instance, he wrestled with whether the PSR is derivable from some more basic principle(s).[7] But by focusing on comparatively stable strands of Leibniz's thought, we will see how (what I call) the 'dilemma of rational cognition' emerges as an enduring challenge to the very possibility of rational cognition from grounds, and thus to sustaining the principle of rational cognition.

To begin with, Leibniz's *New Essays* suggests that the principle of rational cognition is simply definitional of the general notion of ground. By definition, a ground provides *something from which something else can be cognized*: "A ground [*raison*] is a cognized truth [*la verité connue*] whose connection with some less cognized [*moins connue*] truth leads us to give our assent to the latter" (A VI, 6, 475).[8] The faculty of reason is characterized as a faculty for grasping this kind of connection (A VI, 6, 475). The *New Essays* attributes the above metaphysical role to only a subordinate kind of ground, which it calls grounds "especially and par excellence," or *a priori grounds*: "But it is called ground [*raison*], especially and par excellence, if it is the cause not only of our judgment but also of the truth itself—which we call also an *a priori ground* […]" (A VI, 6, 475). That is, an a priori ground not only enables a rational inference to its consequence (it is "the cause of our judgment"), but also makes it the case that its consequence obtains (it is "the cause […] of the truth itself"). His earlier essay "Meditations on Truth, Knowledge, and Ideas" (1684) similarly claims that "a thing is cognized *a priori* […] among other cases, when we understand the way in which a thing can be produced" (AG 26).[9]

Insofar as a ground *by definition* provides something from which something else can be rationally cognized, the principle of rational cognition is entailed by this definition. This definition would therefore explain why all grounds must satisfy the principle. What's more, actual practice might assure us that grounds do satisfy the principle. The geometer seems to attain rational cognition of geometric features from their grounds by applying geometric principles. The physicist likewise seems to rationally cognize why motions occur from their causal grounds by applying causal laws. Indeed, in his essay "On Relations" (1695), Leibniz says that a reasoner who had sufficient insight into the inner parts of things and their circumstances (along with sufficient memory and understanding) and brought these into calculation "would be a prophet and could see the future in the present, as if in a mirror" (G VII 118). *Mutatis mutandis* for metaphysics; Leibniz rules out certain rivalling metaphysical hypotheses due to their failure to satisfy this principle. Consider his famous mill argument against the materialist claim that *matter grounds perception*. This argument rests on the premise that "we must further confess that *perception*, and what depends on it, is inexplicable in terms of mechanical grounds [*raisons*], that is, through shapes and motions"

[6]As Schaffer (2009) suggests: "if numbers are indeed grounded in the concrete realm, then (i) they may be known via their concrete grounds, and (ii) they would be brought down to earth" (361).

[7]For some discussion, see Adams (1994, 67–71) and Bender (2016).

[8]The *New Essays* elsewhere clarifies that cognition need not be propositional; it can include acquaintance with an object or property. As the *New Essays* suggests: "Cognition [*la connaisance*] is taken still more generally in such a way that it is also found in ideas or terms [*idées ou termes*] before one comes to propositions or truths" (A VI, 6, 355). By contrast, 'knowledge' (and its cognates) is typically tied to propositional knowledge.

[9]*Cf.* AG 19, AG 219, AG 294, and T 402. See Adams (1994, 109–11), Hogan (2009), and Smit (2009) for discussion of the notion of an a priori ground and its historical provenance before and after Leibniz. Since the notion of an a priori ground is the notion of ground primarily at issue in metaphysics (per Leibniz's "especially and par excellence" qualifier), I will use the term 'ground' below as shorthand for 'a priori grounds' and the term 'rational cognition' as shorthand for rational cognition involving this kind of ground.

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(*Monadology* §17). Regardless of how complete or perfect one's cognition of matter, one could never cognize perceptions from it. This premise is illustrated by the mill thought experiment. Leibniz subsequently infers from this premise that matter cannot ground perceptions, and thus that materialism is false. This inference presupposes the principle of rational cognition. For if grounds did not have to satisfy this principle, the materialist could simply claim that although perceptions obtain in virtue of matter, it is impossible to rationally cognize the former from the latter.[10]

Of course, Leibniz recognizes that attaining rational cognition from grounds sometimes eludes us. But such cognitive limitations do not undermine the principle of rational cognition. For these limitations merely reflect the finitude of our intellects. They do not preclude the *in principle* possibility of such cognition—say, for God's infinite intellect. As Leibniz clarifies in the preface to the *New Essays*:

> I note, indeed, that I recognize that we are not allowed to deny what we do not understand, though I add that we have the right to deny (at least in the order of nature) what is absolutely unintelligible and inexplicable. I also maintain that substances (material or immaterial) cannot be conceived in their bare essence without activity, and that activity is of the essence of substance in general. And finally, I maintain that the conception of creatures is not the measure of God's power, but that their conceptivity, or ability [*force*] to conceive, is the measure of nature's power; everything in conformity with the natural order can be conceived or understood by some creature. (AG 304)

So from the fact that we are incapable of cognizing something from its ground, we cannot infer that it is "absolutely unintelligible and inexplicable" (and thus cannot regard it as a counterexample to the principle of rational cognition).[11]

In any case, even granting that the principle of rational cognition is definitional of ground and that this definition of ground admits of genuine instances, the following question remains: Under what conditions is something rationally cognizable from its ground at all? Treating the principle of rational cognition as definitional of grounds no more explains how rational cognition from grounds is possible than treating the dormitive virtue as definitional of opium would explain how opium induces sleep. We will now see that to address this question, Leibniz is pressured to accept that rational cognition from grounds requires a certain metaphysical presupposition—it requires grounds to *necessitate* their consequences. More formally:

> **Necessitation Backing Principle:** β is rationally cognizable from its ground α only if α necessitates β, i.e., only if $\Box(\alpha \rightarrow \beta)$.

Yet the kind(s) of necessary connection that holds between a ground and its consequence is ostensibly left increasingly obscure. Two ways of resolving this obscurity will furnish the two horns of the dilemma of rational cognition.

To approach this dilemma, it will prove helpful to follow Leibniz's division of grounds in the *Discourse on Metaphysics* into those that are involved in necessary demonstrations and those that are not (AG 46). Grounds involved in necessary demonstrations are grounds of necessary truths. To wit, they ground necessary truths "based on the principle of contradiction and on the possibility or impossibility of essences themselves" (AG 46). A truth admitting of a necessary demonstration is grounded in an essence; it would contradict the identity of the essence in question for the truth not

[10]For another instance of rational cognition from grounds in Leibniz, see Rutherford's (1992) discussion of the intelligibility of finite substances from their natures.

[11]I leave a fuller investigation of which kinds of rational cognition from grounds are attainable for us (rather than merely for an infinite intellect) for discussion elsewhere. And none of this discussion should be taken to discount the importance of hypothesis, analogy, and observation in Leibniz's account of human cognition and explanation. See, for instance, book IV, chapter 16 of Leibniz's *New Essays*.

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to hold. The truth therefore follows from its ground on pain of contradiction ("based on the principle of contradiction"). Consider the truth *all bachelors are unmarried.* Since part of the very identity of the essence of a bachelor is to be unmarried, this truth follows from this essence on pain of contradiction. This truth is thereby *logically* necessitated by its ground. Because this connection of grounding involves logical necessitation, it is scrutable to reason—namely, via logical analysis of the corresponding concept <bachelor> into its constituent parts (<unmarried> and <man>). *Mutatis mutandis* for other truths admitting of necessary demonstrations.[12]

But some truths lack necessary demonstrations, including those regarding "the free will of God or his creatures" (AG 46). Indeed, Leibniz faces pressure to deny that such truths have necessitating grounds at all. For free actions are generally viewed in his tradition as contingent; they did not have to happen. An agent undertaking a particular free action could have refrained from doing so. Her action was therefore not necessitated by its ground. For instance, although Caesar is the causal ground of his crossing the Rubicon, he could have refrained from this action.

To accommodate the contingency of free actions, Leibniz sometimes proposes that free actions have *nonnecessitating* sufficient grounds ("inclining grounds").[13] Since a nonnecessitating sufficient ground does not necessitate its consequence, the presence of the ground is compatible with the negation of its consequence. Nonnecessitating sufficient grounds would preserve the contingency of free actions; a free action did not have to occur even given the presence of its (nonnecessitating) sufficient ground.

Yet for whatever its virtues, this proposal problematizes the possibility of rational cognition. For even given that a nonnecessitating sufficient ground obtains, the absence of its consequence remains open. This metaphysical indeterminacy in whether the consequence obtains seems to generate a corresponding cognitive indeterminacy: even given complete cognition of a nonnecessitating sufficient ground, the absence of its consequence remains open *for all we cognize.* For instance, given the nonnecessitating sufficient ground of Caesar's crossing the Rubicon, it would remain metaphysically open for Caesar not to cross it. It therefore seems that just by cognizing this nonnecessitating sufficient ground, his crossing would not be cognizable from it. In short, it seems that without the force of necessitation, a ground does not render cognizable its consequence.

At this juncture, Leibniz sometimes digs in his heels by defending the possibility of rational cognition from nonnecessitating grounds (in effect, denying the necessitation backing principle). For instance, he sometimes appeals to his infinite analysis account of contingency. Unfortunately, this account is beset by familiar difficulties.[14]

Leibniz's more typical response does not appeal to nonnecessitating grounds. This response instead purports to reconcile necessitating grounds with the contingency of their consequences by

[12]For more on the connection between ontological priority ("priority in nature") and conceptual priority, see Rauzy (1995), Rutherford (1998), Di Bella (2005), and Futch (2005).

[13]*Cf.* AG 28–29, AG 45–46, and AG 75–76.

[14]For discussion, see Russell (1903), Lovejoy (1936), Adams (1994, 25–30, 34–36), Cover and Hawthorne (2000), Lin (2012), and Jorati (2017). One might wonder why Leibniz does not defend the possibility of rational cognition from nonnecessitating grounds by maintaining that a consequence need not be *certain* conditional on its ground. On this proposal, rational cognition of a consequence merely requires cognition that the consequence follows *with a sufficiently high degree of probability* conditional on its ground. Indeed, one might think that with enough background information about the character of a free agent, her future free actions could be grasped with a sufficiently high degree of probability. One line of response to this proposal would appeal to the conceptual containment theory of truth, taking it to imply that all truths must be demonstrable from their grounds with certainty. Another line of response would claim that *enabling certain rational cognition of something* and *being a sufficient ground* are conceptually intertwined: something is a sufficient ground of something else only if (and because) it enables *certain* rational cognition of the latter. Along these lines, Leibniz sometimes cashes out God's certain cognition of things in terms of his grasp of them from their sufficient grounds. *Cf.* AG 61, AG 70, and AG 102. At any rate, Leibniz takes certainty to be a hallmark of rational cognition: "Only reason is capable of establishing sure rules and of supplying what unsure rules lack by formulating exceptions to them; and lastly capable of finding certain connections in the force of necessary consequences" (*New Essays* A VI, 6, 51).

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distinguishing two different kinds of necessity: absolute and hypothetical. On the one hand, something is *absolutely* necessary if it is necessitated by its ground alone. The consequences in the necessary demonstrations above are absolutely necessary since they are necessitated by their grounds alone. On the other hand, something is *hypothetically* necessary if it is necessitated by its ground when supplemented by background hypotheses. That is, a hypothetically necessary consequence necessarily follows from its ground once the ground is combined with requisite background hypotheses. For instance, the requisite background hypotheses for human-free actions include "the moral principle that all minds will pursue what appears best to them" (AG 70).[15]

To illustrate, consider again Caesar's action of crossing the Rubicon. Caesar had the power to not cross the Rubicon. This action is therefore not absolutely necessary relative to Caesar. Yet given the background principle that all minds will pursue what appears best to them and given that crossing the Rubicon appeared best to Caesar, this action necessarily follows from its ground in Caesar. So despite its contingency, this action is still hypothetically necessary; it has a hypothetically necessitating ground.[16]

Whether distinguishing absolute and hypothetical necessity preserves genuine contingency remains an open question. For instance, one might worry that insofar as the background hypotheses themselves cannot avoid possessing absolutely necessity, the corresponding consequences will remain absolutely necessary.[17] Yet for our purposes, the more pressing question is whether hypothetical necessity really saves the possibility of rational cognition from grounds. That is, are hypothetically necessitated consequences rationally cognizable from their grounds? Answering this question requires specifying the kind of necessity at play in a hypothetically necessary connection. More precisely, it requires specifying (i) on pain of what something follows from its hypothetically necessitating ground and (ii) how cognition of this kind of connection is possible (e.g., through logical analysis or some other means).

Two possible lines of response furnish the two horns of (what I call) 'the dilemma of rational cognition.' On the first horn of the dilemma, all grounds (and *a fortiori* all hypothetically necessitating grounds) make possible rational cognition of their consequences only insofar as they *logically* necessitate them. That is, from a sufficient ground (building in all requisite background hypotheses), its consequence follows on pain of contradiction. I will call this horn 'the logicist horn.' On the second horn of the dilemma, *at least some* grounds nonlogically necessitate their consequences. If a sufficient ground *nonlogically* necessitates its consequence, no contradiction results from combining the sufficient ground (again, building in all requisite background hypotheses) and the negation of its consequence. But their combination is nonetheless somehow impossible. I will call this horn 'the antilogicist horn.' Both horns are prima facie compatible with contingent truths insofar as the grounds necessitating them are not absolutely necessary.

Pending a response to this dilemma, the possibility of rational cognition from grounds promised by the principle of rational cognition remains inexplicable. Note that the PSR is helpless to resolve this dilemma. For the PSR's claim that everything has a ground simply leaves unsettled the kind of necessary connection needed for something to be rationally cognizable from its ground. Insofar as the possibility of rational cognition is built into the very definition of ground (as Leibniz's *New Essays* suggests), this reflects the general point that the PSR *presupposes* what a ground is—the PSR does not *establish* it. Indeed, even if it were denied that absolutely everything has a ground, the present dilemma will still arise for anything that does have a ground.

[15] *Cf.* AG 61, *Theodicy* §174, §282, and §349 (in [G]).

[16] This kind of hypothetical necessity, based on compatibility with moral principles, is sometimes called 'moral necessity.' 'Physical necessity,' based on compatibility with physical causal laws, is another kind of hypothetical necessity. *Cf. Preliminary Discourse on the Conformity of Faith with Reason* §2–3, §20 (in [G]), and *Theodicy* §207. See Adams (1994), Lin (2014), and Jorati (2017, 126-8) for discussion.

[17] For discussion of this and related worries, see Lovejoy (1957), Carriero (1993), Adams (1994), Lin (2012), and Jorati (2017).

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Unfortunately, ascertaining Leibniz's response to the dilemma proves difficult. Ascertaining it would require determining his views on not only freedom, but also physical and mathematical necessity. Some commentators read Leibniz as taking the antilogicist horn.[18] Others read him as taking the logicist horn.[19] In any case, his response evidently produced no lasting peace among his German rationalist successors. For as we will now see, two of his most influential successors, Wolff and Crusius, develop the opposing horns of the dilemma. Troubles await both horns.[20]

3. Embracing the first horn: Wolff's logicist rationalism

After Leibniz's death, the prolific Wolff became the foremost philosopher in eighteenth-century Germany.[21] Wolff enshrines rational cognition from grounds into the very definition of philosophical cognition:

> *Philosophical cognition is rational.* Who is truly instructed in philosophical cognition perceives the ground of that by which something is or is produced (§6 *Disc. Praelim.*), and therefore the connection of both coexisting and mutually successive things (§10 *Cosmologia*), consequently of true universal propositions or of universal truths (§505 *Logica*). Philosophical cognition is therefore rational (§483). (*Psychologia Empirica* §499)

Now the traditional Anglophone reading takes Wolff to offer a reverential (if philosophically suspect) systematization of Leibniz's philosophy.[22] When it comes to their accounts of rational cognition, their views indeed overlap in key respects. Like Leibniz in the *New Essays*, Wolff enshrines the principle of rational cognition into the very definition of ground: "By *a sufficient ground* we understand that from whence it is intelligible [*unde intelligitur*] *why* something is" (*Ontologia* §56). And Wolff likewise holds that the possibility of rational cognition from grounds requires grounds to necessitate their consequences, per the necessitation backing principle. As he suggests: "If the occurrences in the world are certain [*gewiß*], then it is not possible that they should not occur [*kommen solten*]" (*Deutsche Metaphysik* §562).[23] The dilemma of rational cognition is therefore no less pressing for Wolff than it was for Leibniz.

Yet Wolff's rationalism famously takes a logicist turn—the principle of noncontradiction is elevated to the sole highest (or axiomatic) principle of metaphysics (*Ontologia* §27–55). He accordingly claims that the PSR is not an axiom, but a theorem derivable from the principle of noncontradiction (*Ontologia* §70).[24] As for rational cognition, his logicism holds that rational cognition from grounds requires a ground to *logically* necessitate its consequence—necessitate on pain of contradiction. More formally:

> **Logicist Backing Principle:** entity β is rationally cognizable from its ground α only if (and because) α logically necessitates β.

[18]Fisher (2011) and Jorati (2017, 127) argue for the antilogicist reading vis-à-vis causal necessities; Rutherford (2022) argues for it vis-à-vis geometric necessities. For a more general defense of the antilogicist reading, see Wilson (1969).

[19]Lin (2014) argues for the logicist reading vis-à-vis causal necessities. For a more general defense of the logicist reading, see Couturat (1972) and Hogan (2013).

[20]The following discussion nonetheless has implications for understanding Leibniz's position. If he takes the logicist horn, he must face the challenges raised in section IV. If he takes the antilogicist horn, he must face the challenges raised in section V.

[21]Wolff's followers included Alexander Baumgarten, Johann Christoph Gottsched, and Georg Friedrich Meier. See Cassirer (1907), Wundt (1945), Beck (1969), and Watkins (2005) for historiographical background.

[22]Cf. Bennett (1966) and Beck (1969).

[23]*Cf.* Wolff 1730 *Ontologia* §116–17, §297–98, and Wolff 1731 *Cosmologia* §108.

[24]For discussion, see Cassirer (1907), Heimsoeth (1926), Wundt (1945), Tonelli (1959), Beck (1969), Watkins (2005), Hogan (2013), Fugate (2014), and Anderson (2015).

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Wolff thereby embraces the logicist horn of the dilemma of rational cognition. The success of Wolff's embrace of the logicist horn hinges on the success of his derivation of this principle. Unfortunately, his derivation has gone largely neglected.[25]

My guiding thread is that Wolff's derivation rests upon his (oft-underappreciated) cognitive turn in philosophy. *Pace* the traditional Anglophone narrative, Wolff does not blindly ("dogmatically") pursue metaphysics at the cost of investigating how metaphysical cognition is possible at all. To the contrary, that is precisely his accusation against his metaphysically inclined predecessors! For instance, he accuses Descartes and Spinoza of failing to distinguish the intellect's contribution to cognition from that of the senses and imagination (*Theologia Naturalis II* §687–88). By appealing to what appeared "clear and distinct" without adequately grasping what is required for clear and distinct cognition, they were prone to spurious metaphysical conclusions.[26] To avoid this predicament, Wolff's cognitive turn undertakes (i) a systematic analysis of our cognitive faculties (imagination, reason, etc.) and (ii) the conditions under which cognition is possible in light of them. I accordingly propose that Wolff's derivation of the logicist backing principle from this analysis involves the following two steps.[27]

First, closely tied to Wolff's systematic analysis of our cognitive faculties is his division of cognition into a posteriori and a priori cognition. Whereas a posteriori cognition is wrought from experience, a priori cognition is wrought through reason: "What we adduce from experience is said to be cognized *a posteriori.* What becomes known [*innotescit*] from our true reasonings is said to be cognized *a priori. Mixed* is cognition that is acquired partly *a posteriori*, partly *a priori*" (*Psychologia Empirica* §434).[28] Wolff then analyzes reason as follows:

> *Reason* [*Ratio*] is the faculty of considering [*intuendi*] or perceiving the connection of universal truths. *Leibniz* in discussing conforming to reason and faith in the *Theodicy* (from §23) defines *reason* by the chaining of truth. […] Leibniz's definition therefore differs from ours insofar as he would not consider reason for [*pro*] a faculty of the soul, but for the object towards which the intellect turns. (*Psychologia Empirica* §483)

By its very essence, reason is a faculty with the power to grasp connections among universal truths. On the one hand, this characterization of reason indicates that reason grasps connections among truths by employing rules of inference (*Psychologia Empirica* §482–83). For instance, from the cognitions *all Fs are Gs* and *all Gs are Hs*, reason can inferentially cognize *all Fs are Hs.* On the other hand, this characterization implies that reason's cognition proceeds from cognition of universal truths. A universal truth (e.g., *all Fs are Gs*) does not immediately refer to singular objects, but rather to *all* objects of a certain kind ("all *Fs*"). A universal truth thereby differs from both particular truths (e.g., *some Fs are Gs*) and singular truths (e.g., *x is F*) (*Logica* §513). So

[25]Despite his logicist backing principle and logicist derivation of the PSR, Wolff aspires to avoid the absolute necessitarian conclusion that *everything is absolutely necessary*. See, for instance, Wolff 1737 *Theologia Naturalis II* §355, §528–78, and §671–716. I leave this challenge for discussion elsewhere. In any case, this challenge is downstream from Wolff's derivation of the logicist backing principle.

[26]To mention just one example, Wolff accuses Spinoza of conflating a mathematical notion of infinity (stemming from the imagination) with a metaphysical notion of infinity (stemming from the intellect). Spinoza is subsequently misled into attributing mathematical infinity to God (*Theologia Naturalis II* §688–94, §706).

[27]I am far from the first to identify Wolff's cognitive turn. Important works here include Campo (1939), École (1979), Cataldi (2001), Kreimendahl (2007), Dyck (2014), Vanzo (2015), Dunlop (2018), and Gava (2018). But as far as I can tell, none have reconstructed how Wolff's derivation of the logicist backing principle rests on his analysis of reason, and thus how his derivation is predicated upon his cognitive turn in metaphysics.

[28]*Cf.* Wolff 1728a *Disc. Praelim.* §3–12. Our focus here on rational cognition (and by extension a priori cognition) should not mislead to mistake a posteriori cognition for an afterthought in Wolff. He in fact holds that a posteriori cognition provides the data from which all rational cognition of existing objects proceeds. *Cf. Disc. Praelim.* §11 and *Logica* §738. For discussion, see the works cited in the previous footnote.

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reason's cognition of singular truths and their connections must run through, at least in part, cognition of universal truths.[29]

In short, then, Wolff's characterization of reason implies that rational cognition of something from its ground requires inferring it by means of a universal truth that expresses its connection to its ground. Such universal truths are provided by *rules* or *laws*; a 'rule' is defined as expressing the connection between something and its ground (*Ontologia* §475 and §866). For instance, a rule of Euclidean geometry might express how the number of the angles of a geometric figure is grounded in the number of its sides (*Ontologia* §56). Likewise, a law of physics might express how the motions of a body is causally grounded in the exertion of attractive and repulsive causal forces (*Cosmologia* §197). To illustrate, consider the singular truth: *this glass falls to the ground.* By inferring this occurrence from cognition of Newton's laws of motion and prior states of the world, the physicist can rationally cognize not merely *that* it occurs, but *why* it occurs (*Psychologia Empirica* §499). Similarly, by inferring the magnitude of a composite from the magnitude of its parts, one can rationally cognize not merely *that* it has a certain magnitude, but *why* it does (*Ontologia* §628–29).

Since rational cognition from grounds must run through cognition of universal truths, the possibility of rational cognition from grounds turns on how cognition of universal truths is possible. This brings us to the second stage of Wolff's derivation of the logicist backing principle: Under what conditions is cognition of a universal truth possible? For Wolff, the answer lies in logic, for logic is the part of philosophy that explicates the concepts and conditions under which our cognitive faculties can attain cognition (*Disc. Praelim.* §61).[30]

Wolff offers the following definition of truth in logic:

> *Truth is the determinability of a predicate by the notion of a subject.* An affirmative universal proposition is true when the predicate can be determined by the notion of the subject, posited absolutely or from a certain mode of determination. An affirmative particular proposition is true when it is contained under a true universal proposition [*sub universaliter vera*] (§510), and therefore again when the predicate is determinable by the notion of the subject (§509). Finally, a singular proposition is true when the predicate is determined by that which belongs to the notion of an individual considered in a given case (*Logica* §513).

Truth—at least insofar as it is cognizable by us—consists in the determinability of a predicate by the notion of the subject. For affirmative universal truths (of the form *all Fs are Gs*), the predicate is "posited absolutely or from a certain mode of determination." In both cases, affirmative universal truths hold on pain of contradicting the identity of the subject (*Logica* §520–48). In the former case (where the predicate is "posited absolutely"), the predicate follows from analysis of the subject without any background hypotheses. That is, the concept of the predicate is already a part of the concept of the subject, and thus part of the latter's identity (*Logica* §213–14). Schematically, if subject <F> is analyzable into <G> as one of its constituent parts, the universal truth that *all Fs are Gs* follows on pain of contradiction. Such universal truths are ipso facto absolutely necessary (*Ontologia* §302).

[29]Wolff takes this characterization of reason to depart from Leibniz's. Wolff references Leibniz's *Theodicy* (§23), which characterizes reason as "the inviolable chaining of truths [*l'enchainement inviolable des verités*]." This is to define reason in terms of its object ("the object toward which the intellect turns"). By contrast, Wolff defines reason here as a *faculty* of the soul. A faculty (by definition) contains powers for certain kinds of activity (Wolff 1732 *Psychologia Empirica* §29). Strictly speaking, an infinite intellect (such as God's) would not have cognitive faculties at all since it contains no (mere) potentiality, but rather is purely actual (Wolff 1736 *Theologia Naturalis* §163). Divine reason would accordingly be pure act, not a faculty (*Theologia Naturalis* §284–9). Finally, Wolff may be overstating his differences with Leibniz above, insofar as Leibniz characterizes reason as a faculty elsewhere, e.g., in the *New Essays* (A VI, 6, 475).

[30]As Dunlop (2018) notes, Wolff's definition of logic—in terms of providing conditions on cognition, rather than (say) a deductive system or semantics—reflects earlier definitions of logic in early modern philosophy.

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In the latter case (where the predicate is posited "from a certain mode of determination"), the concept of the predicate is still part of the concept of the subject albeit only when the latter is adjoined to certain background hypothesis or conditions (*Logica* §534). Schematically, if subject <F> plus the requisite background conditions <H> are analyzable into <G>, the universal truth *all Fs are Gs* follows on pain of contradiction. So unlike Leibniz, Wolff unequivocally maintains that even hypothetically necessitated truths follow from their grounds on pain of contradiction. As he puts it elsewhere: "what is hypothetically necessary is that whose opposite does not involve a contradiction except under a given hypothesis" (*Ontologia* §318). For instance, once empirical background conditions are supposed, even universal truths expressing empirical causal laws hold on pain of contradiction. Since affirmative universal truths hold on pain of contradicting the identity of the subject in both cases, such truths are to that extent logically necessary.[31]

So precisely as we set out to show, Wolff's derivation of the logicist backing principle hinges on his cognitive turn in philosophy: his analysis of our cognitive faculties and the conditions under which truths are cognizable for them. To wit, since (i) Wolff's analysis of reason implies that all rational cognition runs through cognition of universal truths and (ii) his analysis of truth implies that all universal truths cognizable by us are logical truths, all rational cognition runs through logical truths. *A fortiori*, all rational cognition from grounds runs through logical truths. Since such logical truths express logically necessary connections, it follows that rational cognition from grounds is possibly only insofar as grounds stand in logically necessary connections to their consequences—precisely as the logicist backing principle says.

Does Wolff's logicist account of rational cognition succeed? On first approach, it may seem that not all universal truths are derivable via logical analysis. For instance, it may seem that physical laws do not hold on pain of contradiction. No matter how much logical analysis is undertaken, it may seem that the true physical laws are not derivable by logical analysis of their constituent concepts (of <force>, <mass>, etc.). But this objection is too quick. Such seemings can be taken to merely reflect our psychological limitations (as finite beings) to execute the requisite logical analyses. As Wolff warns, "if we cannot conceive [*begreifen*] or intelligibly explain it [the effect of something—JS], nothing more follows from this than that we do not understand it, and therefore nothing more than that we are guilty for our ignorance" (Wolff 1720 *Deutsche Metaphysik* §129).[32] Since Wolff's logicist project is merely committed to the *in principle* possibility of the requisite logical analyses, practical limitations encountered in executing the project pose no irresolvable challenge to it.

A more incisive criticism is that Wolff's formal framework of conceptual containment is too impoverished to logically derive all universal truths—even in principle. To wit, his framework faces well-known limitations in capturing hypothetical truths, disjunctive truths, many-place relations, etc.[33] But even if this criticism were decisive against Wolff's execution of the logicist project, it might not be decisive against the logicist project as such. Later logicist projects—employing post-eighteenth-century innovations in formal logic—do not face the same formal limitations.[34] All else being equal, then, a criticism of Wolff's logicist project would be more incisive if it did not simply focus upon the formal limitations of Wolff's logic. And as we shall now see, Wolff's acute

[31]*Cf.* Wolff 1728b *Logica* §213–31, §392–94, §397, §516, and §523. For further discussion of Wolff's derivation of empirical causal laws, see van den Berg (2011), Anderson (2015), Dunlop (2018), and Gava (2018). In any case, it is misleading to suggest (as Vanzo 2015 does) that because causal laws presuppose empirical background conditions, they do not express necessary connections. These laws indeed do not express absolutely necessary connections (§527 *Cosmologia*), but they do express hypothetically necessary ones (*Cosmologia* §102–18). And as Lenders (1971) and Anderson (2015) detail, Wolff rejects the infinite analysis account of contingency (*Ontologia* §294–327).

[32]*Cf. Ontologia* §834 and *Theologia Naturalis* §170–71.

[33]For this line of criticism, see Friedman (1990) and Anderson (2015). Wolff himself is not oblivious to at least some of these difficulties (*Logica* §415).

[34]See, for instance, the essays on (neo-)logicist metaphysics and philosophy of mathematics in the anthology *Metametaphysics* (Chalmers, Manley, and Wasserman 2009).

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philosophical rival, Crusius, offers such criticisms. So even in light of post-eighteenth-century developments in logic, Crusius's criticisms remain of historical and philosophical interest.

4. Embracing the second horn: Crusius's antilogicist rationalism

Crusius hails from the pietist tradition, which forcefully opposed Wolff and his followers.[35] The pietists notably championed a libertarian account of freedom. On this account, free actions are not necessitated by their grounds. Given this and given that rational cognition from grounds requires necessitation (per the necessitation backing principle), Crusius concludes that free actions are not rationally cognizable from their grounds. He thereby rejects an unrestricted principle of rational cognition; it is not the case that everything is rationally cognizable from its ground. In this respect, Crusius downsizes rationalist paradise. This story has been told by others.[36]

Nonetheless, Crusius retains the principle of rational cognition for all other grounds, which do necessitate their consequences. As he puts it: "Everything that is not a fundamental activity of freedom has, when it arises [*wenn es entsteht*], such a real ground […] from which it can be understood why it is (rather than is not) and why it is so (rather than otherwise)" (*Entwurf* §87).[37] The dilemma of rational cognition is therefore no less pressing for him. As others have noted, he embraces the dilemma's second, antilogicist horn. He not only holds that some grounds non-logically necessitate their consequences, but also introduces nonlogical principles that enable rational cognition of these connections.[38] Unfortunately, gone largely neglected is his innovative argument against logicist rationalism (presented at *Weg* §255–62). Crusius places Wolff's cognitive turn on its head: he pays for rational cognition of nonlogically necessary connections in the coin of expanding reason's cognitive powers.[39] In the first step of his argument (as I will sketch it here), he clarifies a certain kind of necessary connection that would be *nonlogical*—that would not obtain on pain of contradiction. In the second step, he proposes that cognitive purchase on this kind of connection is wrought through reason's power of thinking. This culminates in his axiomatization of two nonlogical principles of reason, which express how rational cognition from (nonlogical) grounds is possible.[40]

First, Crusius isolates a source of *nonlogically* necessary connections by isolating a space of concepts that is prior to any application of the principle of contradiction. As he puts it: "The principle of contradiction thus already presupposes certain concepts, which already have their

[35]Other important Pietist philosophers include Christian Thomasius, Andreas Rüdiger, Adolph Friedrich Hoffmann, and Johann Lange. I focus on Crusius here because of both his philosophical depth and his influence on Kant. For historiographical background, see Cassirer (1907), Wundt (1945), Beck (1969), Watkins (2005), and Dyck and Sassen (2021).

[36]See Cassirer (1907), Heimsoeth (1926), and Hogan (2009).

[37]Crusius regards the metaphysical and cognitive roles of grounds as jointly definitional of (what he calls) a priori ideal grounds (Crusius 1745 *Entwurf* §87).

[38]*Cf.* Cassirer (1907, 521–57), Heimsoeth (1926, 206–28), Wundt (1945, 254–64), Tonelli (1959, 129), Beck (1969, 396), Watkins (2005), Hogan (2009), and Stang (2016).

[39]Note that Crusius characterizes reason quite broadly: "Reason [Vernunft] is called that degree of perfection of an intellect [Verstandes] through which it is apt to cognize truth as truth with consciousness." (Crusius 1747 Weg §62).

[40]Admittedly, it might seem slightly infelicitous to describe these principles as nonlogical and the corresponding kind of necessity as nonlogical. For Crusius suggests a *broad* notion of logicality, according to which anything that makes the intellect apt to cognize the truth is logical: "Logic should, in virtue of [*vermöge*] its first concept, be that science [*Wissenschaft*] which makes the intellect more apt to have insight into truth and to cognize truth as truth" (Crusius 1747 §54 *Weg*). This broad notion of logicality would include principles whose violation do not entail a contradiction, insofar as those principles still make cognition possible. Nonetheless, these principles would not be logical according to a *narrow* notion of logicality based on the principle of noncontradiction, according to which something is logically necessary insofar as its negation entails a contradiction. In using the terms 'logical' and 'nonlogical' below, I shall continue to have in mind this narrow notion of logicality. Just as the broad notion of logicality is not foreign to Wolff (given his definition of logic mentioned above), this narrow notion of logicality is not foreign to Crusius—he describes his own principles whose violations do not entail a contradiction as expressing "only a physical necessity" (§261 *Weg*).

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constitution, and to which one applies it" (*Weg* §258). In this 'prelogical space' (as we might call it), concepts cannot contradict either themselves or each other because they have the following two features. First, the concepts would all be simple. For a concept contradicts itself only if its constituent parts contradict each other. For instance, the concept <square circle> is self-contradictory because its constituent parts contradict each other. Since a simple concept has no conceptual parts, it cannot contradict itself. Second, the concepts within this prelogical space would all be positive, or unnegated. For a concept contradicts another concept only if one contains the negation of the other (e.g., <married> and <not-married>). Since two concepts that are both completely positive contain no negations within themselves, they cannot contradict each other.[41]

Because concepts that are both positive and simple are not apt to contradict either themselves or each other, they would be apt to express the real elements (or "matter") of possibility that are prior to any application of the principle of noncontradiction (*Weg* §258). Below, I will follow Crusius in describing concepts that are both positive and simple as *first concepts* (*Weg* §492). Now because first concepts cannot contradict themselves or each other, any necessary connections among them cannot hold on pain of contradiction ("hidden" or otherwise). For instance, suppose <red> and <green> are both first concepts. <red> therefore does not contain <not green> in itself and <green> does not contain <not red> in itself. The combination of <red> and <green> therefore could not generate a contradiction. We thus arrive at the conclusion of the first step of Crusius's argument against logicist rationalism: because any necessary connections among first concepts cannot hold on pain of contradiction, they would have to be *nonlogically* necessary. So insofar as some necessary connections among first concepts are rationally cognizable, it would undermine logicist rationalism's core claim that all rationally cognizable connections are logically necessary.

For his part, Wolff accepts (at least the coherency of) first concepts. Yet he doubts that first concepts are rationally cognizable by us.[42] This brings us to the second step of Crusius's argument for his antilogicist rationalism, in which he undertakes a twofold expansion of our cognitive powers that makes possible rational cognition of both first concepts and necessary connections among them.[43]

Crusius asserts that without being able to prove the possibility of first concepts (i.e., their satisfiability among objects), all cognitive purchase on objects would be lost. As he puts it:

> Now it is still to be shown how one should prove [*erweisen soll*] the first concepts, without whose proof the reality of which would fall away, and our entire cognition would be a mere figment of the mind [*Hirngespinste*], that is, a series of hypothetical consequences, of which all together we would not know in the end whether or not they would have a real object [*reales Object*] outside of thought. (*Weg* §492)

He discusses various strategies for pursuing this kind of proof, and thus for cognizing first concepts (*Weg* §482–92). First concepts provable in this way end up including (among others) <temporal succession>, <causation>, <spatial externality>, <identity>, and <a thing in general> (*Weg* §189).[44]

[41]Whether a concept is positive in this metaphysical sense is not always tracked syntactically, i.e., by the logical negation *not*. For instance, despite lacking any logical negation, *darkness* is a real negation of *light*; the possibility of *darkness* is derived as a privation of the possibility of *light*. So the concept <darkness> would not be among the positive simple concepts within the prelogical space of possibility. (*Cf. Entwurf* §26 and *Weg* §183.)

[42]*Cf.* Wolff 1713 *Deutsche Logik* §18 and *Theologia Naturalis* §454–62. For discussion, see Lenders (1971) and Anderson (2015).

[43]As far as I can tell, Cassirer (1907, 531–32 and 555–57) and Heimsoeth (1926, 213–18) come closest to reconstructing Crusius's argument against logicist rationalism—but they fail to clarify this key expansion.

[44]*Cf. Entwurf* §102 and *Weg* §187–88. Although the Crusian claims in this paragraph are worthy of further scrutiny, I must leave them for discussion elsewhere.

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As for establishing our cognitive purchase on necessary connections among first concepts, Crusius begins by affirming the human intellect's power to think concepts together (*Weg* §255). His key expansion of reason's cognitive powers lies in the further claims that even absent contradiction, (i) what is thinkable to reason tracks what is possible in reality and (ii) what is unthinkable to reason tracks what is impossible in reality.[45] These two claims are codified in Crusius's axiomatization of two nonlogical principles of reason. The first is *the principle of inseparability* [*Satz des Nichtzu-trennenden*]: what cannot be separated in thought cannot exist separately. The second is *the principle of noncombinability* [*Satz des Nichtzuverbindenden*]: what cannot be combined in thought cannot exist together. As he describes them:

> What cannot be separated in thought, cannot be separated in fact; and what cannot be combined in one concept in thought also cannot be combined in fact, regardless that no contradiction could be derived from the concepts; rather only a physical necessity to think the thing, distinctly, and is sensed according to a comparison of all circumstances with one another. (*Weg* §261)

So whereas Wolff's logicist rationalism axiomatizes the principle of noncontradiction alone, Crusius axiomatizes the principles of noncontradiction, noncombinability, and inseparability together as "the first ground of all of our inferences"—the three fundamental principles of reason [*die drei Grundsätze der Vernunft*] (*Weg* §262).[46]

When applied to first concepts, these two highest nonlogical principles yield derivative non-logical principles. On the one hand, certain first concepts cannot be thought separately, even though no contradiction results from their separation. For instance, Crusius has us suppose that thing A does not exist at time t_1 but begins to exist at a subsequent time t_2. He claims that it is unthinkable that thing A lacks a cause of its existence: "Supposing now someone said that thing A has arisen without a cause, he would say something absurd [*ungereimtes*], but nothing contradictory" (*Weg* §260). The unthinkability of A's lacking a cause cannot stem from a contradiction since the concepts involved here (of causation, temporal succession, a thing, etc.) are each simple. So given Crusius's principle of inseparability, the derivative principle follows that *anything that comes into existence must have a cause.* On the other hand, certain first concepts cannot be thought together even though no contradiction results from their combination. For instance, <red> and <green> cannot be thought together in a single point of a body at the same time. So given Crusius's principle of noninseparability, the derivative principle follows that "[a] single point of a body cannot be simultaneously red and green" (*Weg* §259). Since these derivative principles stem from the application of Crusius's two highest nonlogical principles to first concepts, they are prior to any application of the principle of noncontradiction. These derivative principles are therefore likewise *nonlogically* necessary. As Crusius puts it: "For we are talking now of principles that are not identical to the principle of contradiction, but rather deliver the first material on which it can be applied" (*Weg* §261).[47]

These two highest nonlogical principles provide a foundation for rational cognition from nonlogical grounds. Specifically, given that the negation of something is unthinkable (but not contradictory) conditional on its sufficient ground, the principle of inseparability entails that its ground nonlogically necessitates it. So from cognition of the unthinkability of ~β conditional on α, reason can inferentially cognize β from α via the application of the principle of inseparability. For

[45]Care must be taken to avoid confusing what is unthinkable *given our psychological limitations* with what is unthinkable *in principle* (*Entwurf* §58). Crusius offers various maxims for avoiding such confusion. I will leave the *in principle* qualification implicit below.

[46]*Cf.* Crusius 1743 *De Usu* §27-29.

[47]These derivative principles include several PSR-like principles. One is *the principle of sufficient cause* (*Entwurf* §31); another is *the principle of determining ground*, which excludes free actions (*Entwurf* §85).

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instance, if we had adequate cognition of a particular sufficient cause, the negation of its effect would be unthinkable, albeit not contradictory (*Entwurf* §72, §87). The principle of inseparability would therefore entail that this effect is nonlogically necessitated by its cause.

In brief, then, logicist rationalism's restriction of reason's cognitive powers to *what is thinkable based on the principle of noncontradiction* leaves reason unable to cognize *nonlogically* necessary connections among first concepts. Crusius ingeniously overcomes this restriction by expanding reason's cognitive powers based on what is unthinkable to it (in the absence of contradiction), thereby making possible cognition of nonlogically necessary connections among first concepts. This expansion of reason's cognitive powers underlies Crusius's axiomatization of two nonlogical principles: the principles of inseparability and noncombinability. When applied to first concepts, these principles yield cognition of derivative nonlogical principles, which, in turn, enable rational cognition from nonlogical grounds. Yet as we will now see, Crusius's expansive attitude toward reason's cognitive powers proves no less problematic than Wolff's restrictive attitude.

5. Trouble for the antilogicist horn: Crusius's paradox

Underlying Crusius's two highest nonlogical principles is the intellectualist presupposition that reason's power to think certain connections tracks the order of nonlogical possibility (and necessity). This presupposition is still advanced (in some form) by some contemporary philosophers.[48] But it demands scrutiny. Echoing others, Hogan (2009) describes Crusius's defense of this presupposition as "highly dogmatic" (364).[49] This description may well be accurate. Yet I will now argue that Crusius's troubles run far deeper: given certain background assumptions, this presupposition does not itself satisfy the principle of rational cognition—the fact that reason's power to think certain connections tracks the order of nonlogical possibility cannot be rationally cognized from its ground. This leaves Crusius's antilogicist rationalism plagued by inconsistency between its commitment to the principle of rational cognition and its explanation of how such cognition is possible for nonlogically necessary connections. I will call this predicament *Crusius's paradox*. Crusius's paradox would entail that his antilogicist rationalism cannot fully sustain the principle of rational cognition, and thus cannot provide an adequate response to the dilemma of rational cognition.

Crusius's paradox arises from the conjunction of the following three claims. The first is the principle of rational cognition itself, which (as we saw above) Crusius endorses for everything but free actions (*Entwurf* §87). More formally:

(1) **Principle of Rational Cognition:** entity α is a sufficient ground of entity β only if β is rationally cognizable from α [where β is any entity save for a free action].

The second commitment is (what I will call) 'modal nonidealism': although the order of thinkability tracks the order of possibility; something's being thinkable does not make it possible. In Crusius's terminology, thinkability provides an 'indicator' [*Kennzeichen*] of possibility, but not the 'essence' [*Wesen*] of possibility (*Entwurf* §56). Rather, something satisfies the indicator of possibility *because* it satisfies the essence of possibility.[50] A bit more formally:

(2) **Modal nonidealism:** the indicator of possibility (viz. *thinkability*) is grounded in the (nonideal) essence of possibility. Since possibility and necessity are interdefinable (α is

[48]Among many others, see Bealer (2002) and Chalmers (2012).
[49]*Cf.* Beck (1969) and Watkins (2005). Though see Heimsoeth (1926, 174–85) for a more sympathetic take.
[50]*Cf. Entwurf* §57–58, *Weg* §137 (quoted below), and *Weg* §264. This point is noted by Heimsoeth (1926, 219–20).

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> necessary iff ~α is not possible), a corollary of modal nonidealism is that the indicator of necessity (viz. *that whose negation is unthinkable*) is grounded in the essence of necessity.

Because modal nonidealism expresses a grounding claim, the principle of rational cognition must apply to it. This implies that the indicator of possibility must be rationally cognizable from its ground in the essence of possibility. Now since thinkability is the indicator of possibility on Crusius's view, that means that merely by cognizing that some entity α satisfies the essence of possibility, it must (in principle) be possible to cognize that α is thinkable. *Mutatis mutandis* for necessity; merely by cognizing that α satisfies the essence of necessity, it must be possible to cognize that ~α is unthinkable.

The question becomes whether this implication is sustainable—whether the indicator of possibility (viz. thinkability) is in fact cognizable from the essence of possibility. To answer this question, we must first specify this essence.[51] Crusius describes it as follows:

> Because it depends on whether no thought remains left because of a generated contradiction or only otherwise, the two kinds of unthinkability are not the same kind of effect [*nicht von einerley Effecte sind*]: the reliability with which we can know whether something is impossible hinges on different materials [*verschiedene Stuffen*]. (*Entwurf* §58)

Crusius says here that the (un)thinkability of entity α can stem from one of two different kinds of grounds—from a logical ground ("because of a generated contradiction") or from a nonlogical ground ("only otherwise"). Crusius thereby bifurcates the essence of (im)possibility into logical and nonlogical (im)possibility. In the former case, α is unthinkable (and thus impossible) if (and because) α entails a contradiction. For instance, because *being an unmarried bachelor* entails a contradiction, it is unthinkable. Entailing a contradiction is therefore constitutive of the essence of *logical* (im)possibility.

But now consider the latter case—the essence of *nonlogical* (im)possibility. Crusius cashes out the ground constitutive of this essence in terms of causal powers. That is, entity α is nonlogically possible if (and because) some being has the power to bring about α. As he clarifies:

> For *that something is thinkable* constitutes not the essence of possibility, but only the ground of cognizing it. The essence of possibility consists in an existing cause being available [*vorhanden*] for it. Thus, everything that does not contain a contradiction in itself is possible, because at least God is a sufficient ground available for each one of their kind [*zu allem dergleichen*]. (*Weg* §137)[52]

For instance, unicorns are nonlogically possible if (and because) something has the power to bring unicorns into existence. Likewise, if it is not within the power of some being to bring about ~α (yet no contradiction would result from ~α), α is nonlogically necessary. This point extends to nonlogical necessitation: if conditional on α it is not within the causal power of some being to bring about ~β, α nonlogically necessitates β. For instance, the parts of my water bottle nonlogically necessitate the existence of the water bottle itself if (and because) nothing (not even God) has the causal power to bring the parts into existence without thereby bringing the water bottle into existence.[53] Coupled with the principle of rational cognition, Crusius's causal characterization of

[51]NB: the present question concerns the ground of the thinkability of *the object that is thought* (=α)—not *the vehicle of thinking the object* (=the thought of α). The ground of the latter would presumably instead hinge on some story about the representational capacities of the thinking agent in question.

[52]*Cf. Entwurf* §56 and §121.

[53]This is not an unfamiliar conception of nonlogical necessitation; it is still sometimes suggested that the grounded is necessitated by its ground if the ground is "all God would need" to create in order to create the grounded. *Cf.* Schaffer (2009, 351).

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the essence of nonlogical possibility implies that entity α's thinkability is rationally cognizable from its ground in the fact that some being has the causal power to bring about α. Likewise, this causal characterization implies that α's unthinkability is rationally cognizable from the fact that no being (God or otherwise) has the causal power to bring about α.

This brings us to the third (and final) supposition generating the paradox: there is a *cognitive gap* between the essence of nonlogical possibility (so construed) and its indicator. That is, there is at least one entity α such that even if ~α is cognized as satisfying the essence of nonlogical possibility (i.e., nothing has the causal power to bring about α), α remains thinkable. In other words, the thought of ~α remains open even upon cognizing that nothing has the causal power to bring about α. Stated more formally:

(3) **Cognitive Gap:** The indicator of nonlogical possibility (viz. *thinkability*) is not rationally cognizable from the essence of nonlogical possibility (viz. *causal power*). [*mutatis mutandis* for nonlogical necessity]

To illustrate Cognitive Gap, consider *a maximally large rock*. On the one hand, given Crusius's causal characterization of the essence of nonlogical possibility, a maximally large rock presumably satisfies the essence of nonlogical possibility. That is, God has the power to create a maximally large rock—a larger one would be nonlogically impossible. On the other hand, for any rock, a slightly larger one still seems thinkable. Yet that would imply that a maximally large rock is unthinkable. So a maximally large rock seems to satisfy the essence of nonlogical possibility, but not its indicator—witnessing Cognitive Gap.

Now one might resist this alleged example of Cognitive Gap. One might argue that even God lacks the power to create a maximally large rock. Or one might argue that a larger rock is not thinkable after all. In any case, this example merely serves to illustrate how the essence of nonlogical possibility *might* come apart from its indicator. This provides sufficient motivation to seriously consider how Cognitive Gap would problematize Crusius's position. To wit, Cognitive Gap is inconsistent with the principle of rational cognition and modal nonidealism. For the latter two principles jointly entail (*pace* Cognitive Gap) that the indicator of nonlogical possibility *is* rationally cognizable from the essence of nonlogical possibility. Hence Crusius's paradox.[54]

How, then, does Crusius seek to avoid the paradox, and thus save his antilogicist rationalism? I propose here that he is naturally read as trying to skirt the paradox by denying Cognitive Gap along two different paths: an anthropocentric path (concerning the basis of the connection between the essence and indicator of nonlogical possibility *in us*) and a theocentric path (concerning the basis of this connection *in God*). Yet I will conclude that both paths face difficulties.

The anthropocentric path claims that what is thinkable to us must track the order of (nonlogical) possibility because our intellect contains *a natural drive toward truth.* As Crusius explains:

> One accordingly considers further that in our soul is a natural drive toward perfection [*Vollkommenheitstrieb*]. From this becomes, as soon as the intellect attains a lively effect, the drive towards truth [*Wahrheitstrieb*], *Telematology* §117. It is therefore essential to our soul to follow the intellect insofar as the concepts are distinct [*deutlich*] enough. It is therefore essential to us to assume [*anzunehmen*] the essential constitution of our way of thinking also as the indicator of the truth, and to judge according to this what should be assumed within the concept as true or false. Against this natural disposition the freedom of the will is not at all

[54]Heimsoeth (1926, 220) appears to suggest in passing that Crusius provides no basis for avoiding Cognitive Gap. Nonetheless, he does not clarify that Cognitive Gap conflicts with Crusius's other commitments, and thus how it gives rise to paradox. Nor does Heimsoeth elucidate how Crusius might resist Cognitive Gap (as I do below).

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> capable of something, without only indirectly [*ohne nur indirecte*], Telematology §55, §56. From this arises accordingly the very highest [*allerhöchste*] ground of our inferences, viz. that *that which we cannot think other than as true* is true, and *that which we cannot think absolutely at all or think other than as false* is false. (*Weg* §256)[55]

The intellect's natural drive toward truth renders it necessary for us to assume that its power of thinking perfectly tracks the essence of possibility ("insofar as the concepts are distinct enough"). That is, it simply lies beyond our powers to assume that this power does not track the essence of possibility ("Against this natural disposition …"). By extension, it is necessary for us to assume Crusius's two highest nonlogical principles ("the very highest ground of our inferences"), which capture this connection between the essence and indicator of nonlogical possibility.

One might find problematic Crusius's justification for positing a natural drive toward truth in us. But for the sake of argument, let's grant this drive. Does this anthropocentric path overcome Cognitive Gap? To answer this question, we must heed two different aspects of the challenge posed by Cognitive Gap. First, there is (what we might call) *the genetic question*: why does what is thinkable *to us* track what is nonlogically possible? Second, there is (what we might call) *the constitutive question*: why is nonlogical possibility indicated by *what is thinkable* (rather than some other kind of representational state or no representational state at all)? Whereas the weight of the genetic question falls on why *we* (as finite beings) track the essence of nonlogical possibility (rather than fail to track it), the weight of the constitutive question falls on why we track the essence of nonlogical possibility through *what is thinkable* (rather than some other representational state, or no representational state at all).

Now the problem is that even if a natural drive toward truth helps answer the genetic question, it seems to leave the constitutive question untouched. To say that what is thinkable to us tracks the essence of nonlogical possibility due to our natural drive toward truth *presupposes* that the essence of nonlogical possibility is tracked by what is thinkable; it does not *explain why* the former is tracked by the latter. That is, a natural drive toward truth does not explain why the essence of nonlogical possibility in causal powers manifests itself through *what is thinkable* (rather than through some other representational state). Since a natural drive toward truth does not answer the constitutive question, appealing to this drive does not suffice to overcome Cognitive Gap.

Even if the anthropocentric path fails to overcome Cognitive Gap, Crusius suggests this path will lead us on to the theocentric one. As he puts it: "He [=God] must have such an essence from which the eternity and necessity can therefore be understood of how our drive toward the truth in accordance with the essence of our reason can and must fully rest therein" (*Entwurf* §237). The connection between the indicator of possibility and its essence in us is a limited version of the same connection found in God: what is thinkable to God likewise tracks what is nonlogically possible—α is thinkable to God if (and because) something has the causal power to bring about α (*Entwurf* §269). But why does this connection hold in God? Crusius's answer appeals to how God functions as the ultimate source of causal powers, and thus his role as the ultimate ground of nonlogical possibility.

To wit, God has the causal power to bring about α insofar God has the power to will α (*Entwurf* §154 and §269). And for God to will α, He must first represent α: "The will of God is accordingly also the power to make actual [*wirklich zu thun*] represented actions" (*Entwurf* §275). The representation of α in God amounts to the thought of α. As Crusius clarifies: "The power to think is called the intellect [*Verstand*]. […] If it were supposed that God had no intellect: then he also could not have a will, since the will presupposes the intellect" (*Entwurf* §269). So α's being thinkable to God does not *merely* indicate God's causal power to bring about α—α's thinkability is itself essential to God's causal power to bring about α. Thus, the reason why the indicator of nonlogical possibility in God

[55]*Cf. Entwurf* §15.

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cannot come apart from its essence is that things satisfy the essence of nonlogical possibility only if (and because) they are thinkable to God. By extension, insofar as our intellects reflect God's, it is unsurprising that what is thinkable to us should likewise track what is nonlogically possible (*Weg* §432).

As with Crusius's justification for positing the natural drive toward, one might find problematic Crusius's justification for positing the existence of God (so construed).[56] But for the sake of argument, let's grant his theology. Does the theocentric path then overcome Cognitive Gap? On first approach, it fares better than the anthropocentric path, in that it says something informative about why the satisfaction of the essence of nonlogical possibility guarantees the satisfaction of its indicator. Nonetheless, I surmise that the theocentric path merely pushes Cognitive Gap back. To see this, consider what makes some entity thinkable to God in the first place. Either there is some further ground for why entity α is thinkable to God or there is no further ground. It is not immediately obvious which of these disjuncts Crusius takes, but issues arise either way.

On the one hand, suppose there is no further ground. In that case, α is possible in virtue of nothing more than α's thinkability. The problem with this option is that it contradicts Crusius's modal nonidealism, according to which α's thinkability merely provides the indicator of α's possibility—not the essence of α's possibility. On the other hand, suppose that there is a further ground for why entity α is thinkable to God. This option raises two issues. The first is specifying what exactly this ground would consist in. The second issue stems from the fact that the principle of rational cognition entails that α's thinkability to God must be cognizable from its ground (i.e., the ground in virtue of which α is thinkable to God). How, then, is such cognition possible? Some indicator is evidently needed to cognize the former from the latter. Neither of these issues can be resolved by appealing to God's causal power to bring about α. For the theocentric path's core claim —that God has the causal power to bring about entity α insofar God has the power to will α—itself presupposes that α is thinkable to God. Unfortunately, Crusius's considered answers to these issues are not obvious. But without addressing them, the theocentric path will fail to overcome Cognitive Gap.

Thus, it is far from clear that Cognitive Gap can be overcome through Crusius's anthropocentric or theocentric paths. The basic question remains: Why does the thinkable track the essence of nonlogical possibility? Perhaps further reflections on Crusius would reveal further avenues for answering this question, and thus for overcoming Cognitive Gap. Perhaps. Yet as long as Cognitive Gap remains, Crusius's paradox remains: the principle of rational cognition will be violated at the very foundation of his antilogicist rationalism. In effect, even if Crusius's argument against Wolff's logicist rationalism succeeds, his antilogicist alternative seemingly remains on unstable ground.

6. Conclusion: In search of lost ground

Rationalist paradise promises a conception of reality that is fully intelligible—one in which everything has a sufficient ground from which it can be rationally cognized. Unfortunately, by focusing on challenges concerning the PSR, proponents of the prevailing narrative have neglected a more fundamental challenge facing rationalist paradise: How is rational cognition from grounds possible at all? In Leibniz's wake, we have seen Wolff and Crusius both demote the PSR's axiomatic status; their respective axiomatic principles instead purport to address this challenge. Despite their cognitive turn, a dilemma remains. Whereas Wolff's logicist rationalism struggles to reduce all necessary connections that are rationally cognizable to logically necessary connections, Crusius's antilogicist rationalism struggles to establish cognitive purchase on nonlogically necessary

[56]For one, Crusius's basis for positing the existence of God might seem circular. For he maintains that the only tenable proofs for the existence of God presuppose his two highest nonlogical principles (*Entwurf* §234–35). But the legitimacy of these principles ultimately rests on God. This predicament is perhaps analogous to the infamous Cartesian circle (and perhaps can be defused in analogous ways).

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connections (as Crusius' paradox highlights). And so remains the threat of eviction from rationalist paradise.

Enter a young Immanuel Kant. Like Crusius, Kant rejects Wolff's logicist rationalism.[57] Yet he finds Crusius's particular brand of antilogicist rationalism unsatisfactory. He is left wondering:

> But what I should dearly like to have distinctly explained to me, however, is how one thing issues from another thing, though not by means of the law of identity […] As for this real ground and its relation to its consequence my question presents itself in the following simple form: How am I to understand the fact that, because something is, something else is? […] For example, the existence of the world can be understood with complete distinctness in terms of the omnipotent will of God. But here 'power' signifies something in God, in virtue of which other things are posited. But this word already designates the relation of a real ground its consequence; but it is this relation which I wish to have explained. (Kant 1992 [1762–64] AK 2:202)

Kant's question ostensibly concerns the possibility of rational cognition from grounds; it prompts Kant's reflection "upon the nature of our cognition with respect to our judgment concerning grounds and consequences" (Kant 1992 [1762–64] AK 2:203–4).[58] So for the antilogicist rationalist seeking to avoid eviction from rationalist paradise, how should Kant's question be answered? As we have seen, avoiding eviction requires avoiding Crusius's paradox. And avoiding the paradox would require rejecting one of the three commitments that generates it. Although this paradox has hardly been shown to be insurmountable, rejecting any of these three commitments faces potential challenges—or so I will now tentatively conclude.

The first option would be to deny Cognitive Gap: the indicator of nonlogical possibility is rationally cognizable from its essence, after all. Nice work if you can get it. The above discussion highlights obstacles facing Crusius's ambitious attempt to develop this option. A second, more modest option would instead restrict the principle of rational cognition at its very foundation; it would concede that the indicator of nonlogical possibility is not rationally cognizable from its ground in the essence of nonlogical possibility. Although this modest response avoids Crusius's paradox, it places rationalist paradise upon a chimerical foundation. The rational cognizability of connections of grounding would be founded upon a brute, unintelligible connection between the indicator of nonlogical possibility and its essence. No connection of grounding would be absolutely intelligible. Instead, connections of grounding would be merely hypothetically intelligible, i.e., on the hypothesis of an unintelligible connection between the essence of nonlogical possibility and its indicator.

The difficulties facing these two options might lead the aspiring rationalist to the third option: deny modal nonidealism. This would amount to embracing a form of idealism, on which there is no real distinction between the essence of nonlogical possibility and its indicator. What it is for a connection to be nonlogically possible *just is* for that connection to manifest itself in a certain way in our cognition. Since the essence and indicator of nonlogical possibility are ex hypothesi the very same, the latter can be straightforwardly rationally cognized from the former. No cognitive gap between them arises.

Although the story is undoubtedly complex and requires careful treatment elsewhere, I tentatively suggest that Kant ends up developing the idealist option. As he already indicates in a pregnant *Reflexion* circa 1770: "It is difficult to represent how the consequence follows the ground [*nach dem*

[57]See Cassirer (1907), Heimsoeth (1926), Tonelli (1959), Watkins (2005), Hogan (2013), Anderson (2015), and Stang (2016) for discussion of Kant's rejection of logicist rationalism and Crusius's influence on him.

[58]I surmise that Kant's dissatisfaction with Crusius's antilogicist rationalism is, in part, tied to Crusius's paradox (note his concern in the above passage with appealing to God's causal powers). But I must leave this for discussion elsewhere. Though see *Negative Magnitudes* (AK 2:202-4) and the *Inquiry* (AK 2:293-6), which I discuss in Stratmann (forthcoming). Finally, I bracket here whether logically necessary connections are ultimately any more intelligible than nonlogically necessary ones.

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Grunde sey], if this relation is not merely a phenomenon" (Kant 1900– AK 17:382 Reflexion 4001; my translation). Or as the first *Critique* later develops this idea:

> The proof ["in transcendental cognition"—JS] does not show, that is, that the given concept (e.g., of that which happens) leads directly to another concept (that of a cause), for such a transition would be a leap for which nothing could be held responsible; rather it shows that experience itself, hence the object of experience, would be impossible without such a connection. (Kant 1998 [1781/7] A783/B811)

For the absence of something to be inexperienceable on the supposition of something else, Kant suggests here, is constitutive of a nonlogically necessary connection among empirical objects (Kant 1998 [1781/7] A217–18/B265–66). Since the indicator of this kind of nonlogical possibility (viz. experienceability) is identical to its essence, no cognitive gap between them arises. Kant thereby seems to extend his predecessors' cognitive turn in metaphysics.

Of course, idealism (so construed) is a radical philosophical doctrine. If idealism were truly the cost of securing the possibility of rational cognition involving nonlogically necessary connections, one might wonder whether this is a mark for idealism or rather a mark against the possibility of such rational cognition. In any case, a more systematic assessment of the antilogicist rationalist's options will have to await another occasion. For now, where we end is proof of the beginning: the cost of sustaining the principle of rational cognition drives the threat of eviction from rationalist paradise facing eighteenth-century German rationalism. At base, this principle is a presupposition of the core rationalist claim that things hang together in an intelligible way; that every *Why* admits of an intelligible *Because.* Yet for a principle that promises intelligible answers, it certainly leaves many questions.

Acknowledgments. Thanks to Lucy Allais, Rosalind Chaplin, Sam Elgin, Damian Melamedoff, Don Rutherford, Clinton Tolley, Eric Watkins, several anonymous referees, and audiences at the University of British Columbia, the University of Tennessee, and UC San Diego for invaluable feedback on material discussed in this paper.

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Cite this article: Stratmann, J. 2022. In Leibniz's Wake: Rationalist Paradise Lost. *Canadian Journal of Philosophy* 52: 517–539, doi:10.1017/can.2022.41

https://doi.org/10.1017/can.2022.41 Published online by Cambridge University Press