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Is it Possible to do Without the Fundamental?

Markel Kortabarria[1]

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Abstract
This article argues that one of the main arguments against metaphysical infinitism—the argument from vicious infinite regress—is unsuccessful. I suggest that a proper interpretation of the argument takes the charge against infinitism to be one of metaphysical insufficiency: without the fundamental facts fully grounding the rest of reality, derivative facts lack the necessary grounding base for their obtaining. I disambiguate the insufficiency claim by examining it from two different perspectives on the regress: the local perspective, which focuses on the obtaining of the individual derivative facts, and the global perspective, which focuses on the obtaining of the entire collection of derivative facts. For each perspective, I argue that the reasons for believing that infinitism cannot provide sufficient grounds are problematic.

Keywords Grounding · Fundamentality · Metaphysical infinitism · Metaphysical foundationalism

1 Introduction

Metaphysical foundationalism (hereafter, 'foundationalism') is the view that reality has a fundamental basis on which everything else depends. Expressed in terms of grounding, it is the idea that grounding is a *well-founded strict partial order*—i.e., that grounding is irreflexive, asymmetric, and transitive and that there are certain fundamental facts, *the fundamentalia*, which fully ground every other derivative

✉ Markel Kortabarria
mkortabarriaareitio@gmail.com

[1] LOGOS Research Group in Analytic Philosophy, Barcelona Institute of Analytic Philosophy (BIAP), University of Barcelona (Department of Philosophy), Elordugoitia Nº5 1D, 48100 Mungia, Bizkaia, Spain

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fact and which are themselves ungrounded (Dixon, 2016; Rabin & Rabern, 2016).[1] Metaphysical infinitism (hereafter, 'infinitism'), on the other hand, is a species of anti-foundationalism. Infinitists agree that grounding is a strict partial order, yet they deny that this relationship is well-founded. Indeed, infinitists deny that there are any fundamentalia at all. Consequently, infinitists think that grounding relations descend infinitely without ever reaching a fundamental level.[2]

Metaphysicians have long favoured foundationalist accounts of metaphysical structure. Yet, the task of pinpointing what exactly is wrong with infinitism has proved difficult. This article adds to the foundationalist complication by arguing that one of the main arguments in favour of the existence of the fundamenalia—*the argument from vicious infinite regress*—is unsuccessful. I suggest that a proper interpretation of the argument takes the charge against infinitism to be one of *metaphysical insufficiency*: without the fundamental facts fully grounding the rest of reality, derivative facts lack the necessary grounding base for their obtaining. I then assess the strength of the objection by considering different interpretations of insufficiency that might be thought to underlie the argument. Ultimately, I conclude that none of them succeeds in discrediting infinitism as a possible view of metaphysical structure.

The structure of the paper is as follows: Section 2 briefly introduces some of the standard principles of grounding. Section 3 develops the foundationalist critique, suggesting that what lies at the heart of the regress argument is the idea that the metaphysical grounds available to the infinitist are insufficient to bring about the obtaining of any facts. Section 4 analyses the argument from the local perspective, in terms of the grounds for the obtaining of the individual derivative facts in the infinite chain. I distinguish between two senses of insufficiency: the sole availability of partial grounds that never add up to full grounds, and the lack of ultimate grounds. After showing that, on either interpretation, the anti-infinitist argument proves inconclusive, I propose a more promising meta-grounding interpretation. Unfortunately, there are ways for the infinitist to resist. Finally, Section 5 challenges recent arguments to the effect that the viciousness of the grounding regress should be conceived globally, in terms of the obtaining of the entire collection of derivative facts.

[1] Note that this notion of *metaphysical well-foundedness* (Bohn, 2018, fn. 5) is less demanding than the traditional set-theoretic definition. An order is set-theoretically well-founded iff every non-empty subset of the domain has a minimal element (Rabin & Rabern, 2016, fn. 15). Assuming the axiom of dependent choice, this entails that there are no infinitely descending chains. However, this is too strong, since there are possible grounding structures that are infinitely descending and yet appear to be well-founded in a very clear sense (Rabin & Rabern, 2016, p. 361; see also Cameron, 2022). Consequently, while set-theoretically well-founded grounding entails foundationalism, the reverse is not the case. For a comprehensive discussion on the issue of what notion of well-foundedness is relevant for the characterization of foundationalism, see Dixon (2016) and Rabin and Rabern (2016).

[2] Accordingly, for the purposes of this paper, infinitism will be taken to correspond to what is sometimes called 'strong infinitism' (Thompson, 2016). A weaker version of infinitism merely contends that *some* grounding chains are infinitely descending, this is compatible with the existence of fundamentalia.

2 Ground, Structure, and Explanation

According to orthodoxy, grounding is a primitive non-causal relation of constitutive determination between facts.[3] It captures the idea that certain facts obtain *in virtue of* others in a generative and distinctly metaphysical way. By way of illustration, it is often said that [Socrates exists] grounds [{Socrates} exists] in the sense that the obtaining of the former fact is what metaphysically determines the obtaining of the latter (I follow the convention of using square brackets to denote facts; [φ] is the fact that φ.)

Grounding is canonically understood as being irreflexive, asymmetric, and transitive (Audi, 2012; Correia, 2010; Fine, 2012; Raven, 2012, 2013).[4] As such, it is said to induce a strict partial ordering among the facts it relates. Most proponents also take grounding to be *factive*, so that if [ψ] grounds [φ], then it is the case that both [ψ] and [φ] hold. However, some metaphysicians have advanced *non-factive* conceptions, where grounding is understood to relate possible facts (Bertrand, 2022; Fine, 2012; Litland, 2017).

Grounding exhibits two hallmark features: first, it provides us with characterizations of both *relative* and *absolute* fundamentality. Indeed, it is part of the ground-theoretic approach to define derivative facts as facts that are grounded in more fundamental facts. Likewise, it is common to characterize the fundamental facts as facts that are ungrounded. Second, grounding is said to be explanatory. Unionists believe that grounding is itself a form of metaphysical explanation (Dasgupta, 2017; Fine, 2012; Litland, 2015; Raven, 2012), whereas separatists prefer to think of grounding as the determinative relation that is uniquely apt to back up (at least some form of) metaphysical explanation (Audi, 2012; Schaffer, 2016; Trogdon, 2018b). The debate between unionists and separatists is intertwined with important issues regarding the characterization of grounding and (metaphysical) explanation that I cannot hope to cover here (see Maurin, 2019). It is worth noting, however, that if one is a grounding realist, a similar kind of problematic regress would seem to ensue for the infinitist, regardless of how the explanatoriness of grounding is characterized.[5]

Another important distinction in the use of grounding as a metaphysical tool concerns the difference between *full* and *partial* grounds. It is standard to define partial grounds in terms of full grounds (e.g., Rosen, 2010, p. 115; Audi, 2012, p. 698; Fine, 2012, p. 50; Raven, 2013, p. 194; Litland, 2015, p. 484). According to this

[3] I take facts to be worldly structured entities constituted by objects, properties, and relations. More liberal understandings take grounding to connect entities of any category (Schaffer, 2009). If desired, the discussion could be rephrased.

[4] See Jenkins (2011), Schaffer (2012), Rodriguez-Pereyra (2015) and Thompson (2016) for challenges to the canon.

[5] One might then wonder whether it is not preferable to be an anti-realist about grounding and/or metaphysical explanation (Thompson, 2021, 2023). This route remains fully open. However, I will not explore it. For one thing, it sacrifices the realist spirit that set much of the grounding project in motion (Fine, 2001; Schaffer, 2009) and that many, I suspect, wish to preserve. More importantly, indulging in anti-realism may have advantages, but it certainly does not save one from the regressive worry. At most, it mitigates the problem somewhat by making the regress epistemological rather than metaphysical.

definition, [ψ] is a partial ground of [φ] iff it is one of the things that, taken together, constitute a full ground of [φ]. Given this definition, we may distinguish full and *merely* partial grounds in roughly the same way we differentiate between complete and incomplete explanations (Raven, 2015, p. 324; Litland, 2015, p. 484; Trogdon & Witmer, 2021, p. 262). Thus, to say that [ψ] fully grounds [φ] is analogous to saying that [ψ] provides a complete metaphysical explanation of [φ]. Similarly, to say that [ψ] merely partially grounds [φ] is to say that [ψ] provides only an incomplete metaphysical explanation of [φ]. Alternatively, one could illuminate the distinction by analogy with causation: in this sense, full grounds are akin to *sufficient metaphysical causes*, whereas merely partial grounds are akin to *merely contributory metaphysical causes* (Schaffer, 2016, p. 56; Wilson, 2018, p. 726).

Three important remarks. First, the definition allows full grounds to be made up of single partial grounds (Fine, 2012); this marks a further distinction between single partial grounds, which are mere in the sense that they do not constitute a full ground, and single partial grounds, which are also full grounds. Second, it is a largely undisputed assumption that full grounds are sufficient to bring about the obtaining of what they ground, while merely partial grounds are usually regarded as insufficient.[6] Third, the traditional definition entails that partial grounds are *completable* (Leuenberger, 2020, p. 2656): for every fact [φ], if [φ] is partially grounded in [ψ], then, necessarily, there is a collection of facts Γ such that [φ] is fully grounded in Γ and [ψ] is part of Γ. As Leuenberger (2020) has pointed out, completability entails that grounding is *dichotomous.* That is, it entails that, necessarily, all facts are either fully grounded or not grounded at all.

More could be said about grounding. For the purposes of our discussion, this characterization will suffice. In the next section, I introduce the two primary types of arguments supporting foundationalism: arguments from theoretical virtue and arguments from vicious infinite regress. After dismissing the former as inadequate for resolving the metaphysical dispute, I concentrate on the latter. I then present the insufficiency interpretation as the most suitable way to understand the foundationalist critique.

3 The Argument from Insufficiency

Arguments in favour of the existence of fundamentalia proceed on one of two fronts. On the one hand, there are arguments from theoretical virtues such as those put forward by Cameron (2008) and Brenner (2023). The idea behind these arguments is that foundationalism offers a simpler and more unified picture of the world than theories that deny that reality bottoms out at some fundamental level.[7] By dispensing

[6] Two notable exceptions are Leuenberger (2020) and Trogdon and Witmer (2021), who have presented counterexamples of *incompletable* mere partial grounds that are nevertheless metaphysically sufficient.

[7] Metaphysical coherentists claim that grounding relations do not even form a strict partial order; in particular, they think that such relations can obtain symmetrically allowing for the possibility of grounding loops. See Thompson (2016, 2018). Morganti (2018), and Dixon (2023) for some explorations.

with the fundamentalia infinitists incur a heavy theoretical cost, namely they lose the ability to give a common explanation of the obtaining of all dependent things (Cameron, 2008, p. 12). This, in turn, should lead us to regard theories that postulate a well-founded grounding structure as "antecedently more likely to be true" (Brenner, 2023, p. 1167).

Assessing arguments based on theoretical virtues faces familiar problems. Much depends on the virtues that are selected, the criteria for their evaluation, and the way in which they interact or must be weighed against each other. Moreover, it has been repeatedly pointed out that virtue-based arguments offer, at best, reasons in favour of theory choice and are not capable of establishing whether a metaphysical theory is true or false (e.g., Bueno & Shalkowski, 2020; Huemer, 2009; Kriegel, 2013; Shalkowski, 2010; Thomasson, 2015). In any event, it is not obvious that foundationalism is more virtuous than its rivals (Bliss & Priest, 2018, pp. 26–27; Thompson, 2018, pp. 116–117). Foundationalism is silent about the number of entities that populate the fundamental level. It is also the only theory that contains an additional kind of facts, namely the fundamental. And while foundationalism provides a unified explanation for the obtaining of all derivative facts, it is the only theory that postulates unexplained brute facts. Foundationalists therefore seem to have a short run on this avenue. Something more is required to rule out the metaphysical possibility of infinitism, which brings us to the second type of argument used in defense of foundationalism: arguments from vicious infinite regress.

Regress arguments take a place of pride in discussions of fundamentality. The idea can be traced back to Leibniz (1989, p. 85) who objected to the coherence of infinite mereological structures on the grounds that where there is only being *by aggregation*, there is no real being, for every being would depend on an infinite series of other beings, such that there would never be a ground that could grant existence in the first place. Taking up the Leibnizian spirit, Schaffer (2010, 2016) has recently argued against the possibility of non-terminating chains of grounding on the basis that grounds without a source entail a failure in the *transmission* of being (2016, p. 95). The idea is that dependent entities can only have being if they inherit it via a relationship of full grounding from other entities that have being themselves. But since the transmission of a property cannot be postponed forever, there must be some unconditional possessor who can bestow the relevant property upon all the other elements of the chain.[8] To use a famous catchphrase, were there no fundamentalia to fully ground reality, "being would be infinitely deferred, never achieved." (2010, p. 62).

One notable problem with this construction of the argument is that it hinges on the plausibility of the inheritance metaphor, which would in turn seem to rely on diachronic thinking and the assumption that the universe is temporally finite (Trogdon, 2018a, p. 188). However, such causal intuitions are out of place in this context. Grounding does not adhere to a dynamic model of property transfer according to which being is *passed* from ground to groundee (Bohn, 2018, p. 170). Rather, it

[8] I assume that being is a property to the extent that Schaffer does. But this assumption need not matter much for our discussion. In the remainder I speak of facts that obtain or fail to obtain.

is a synchronic relation of determination according to which the obtaining of the grounded entity depends constitutively on the obtaining of its grounds. Moreover, it is a category mistake to think that being can be inherited. Things cannot exist *due to* inheritance of being, rather existence is a precondition for any form of inheritance (Trogdon, 2018a, pp. 189–190).

I am sympathetic to these criticisms. But instead of repeating what others have said or trying to rescue the transmission talk, I wish to propose an alternative interpretation that might underlie this and similar arguments from vicious infinite regress. My suggestion is that we focus on the failure-of-being locution as an alternative to Schaffer's transmission-of-being model and think of the regress of grounds as *precluding* (rather than deferring) being. Where a failure of being is a failure in the *metaphysical sufficiency* of whatever it is that makes that being possible. More precisely, and in fact terms, there is a lack of metaphysical sufficiency for the obtaining of some fact [φ], if there is a set of sets of facts Γ such that the obtaining of [φ] requires that at least some member Ψ of Γ be such that all facts in Ψ obtain, while in actuality no member Ψ of Γ is such that all facts in Ψ obtain. That is, by subtracting the fundamentalia from the grounds of derivative facts, infinitists are said to render such grounds *metaphysically insufficient.* This, I argue, is a more adequate interpretation of the foundationalist critique. Infinitists are accused of generating a vicious regress of grounds that is metaphysically insufficient to bring about the obtaining of any derivative facts. Consequently, the argument from vicious infinite regress views infinitism as exhibiting a kind of metaphysical failure, whereby facts fail to obtain due to them being insufficiently grounded.[9] As we shall see, what this insufficiency claim targets can vary depending on the perspective one takes on the regress.

Explanatory variants of the argument lend additional support to this interpretation. Dasgupta (2016), for example, suggests that a grounding version of the principle of sufficient reason, according to which every substantive fact requires a complete metaphysical explanation, commits us to the existence of autonomous facts.[10] These facts are necessary because, without them stopping the regress, the metaphysical account of the obtaining of derivative facts would be unsatisfactory or otherwise incomplete (2016, pp. 382–383). Likewise, when discussing the principles of ground, Fine claims that "there is still a plausible demand on ground or explanation that we are unable to evade. For given a truth that stands in need of explanation, one naturally supposes that it should have a 'completely satisfactory' explanation, one that […] terminates in truths that do not stand in need of explanation." (2010, p. 105). And in considering the possibility of infinite chains of grounds, Cameron admits that "at least in some infinite regresses of metaphysical determination, we

[9] There is an interesting question as to whether all problematic regresses share a source of viciousness. Proposals include analyses in terms of contradiction (Clark, 1988; Nolan, 2001), dependence (Aikin, 2005; Klein, 2003; Maurin, 2007), failure of reduction (Nolan, 2001), and failure of analysis (Bliss, 2013). Recently some authors have argued that we should adopt a pluralist approach to viciousness (Cameron, 2022; Nolan, 2019). Although sympathetic to the latter view, I remain neutral on this matter.

[10] Dasgupta distinguishes *fundamental facts* from *autonomous facts*. I shall say more about the distinction in the next section when analyzing a particular interpretation of insufficiency.

are left without a complete explanation as to why the non-fundamental facts on that infinite chain obtain." (2022, p. 90).[11]

Some might complain that these readings, insofar as they are *explanatory*, do not support the insufficiency interpretation. Whether explanations succeed is a mind-dependent matter, and so the relevant sense of completeness should be construed in epistemic rather than metaphysical terms. However, if the complaint were true, the arguments would be no good for making a case against the *possibility* of infinitism. Indeed, we would be back in the virtue-theoretic game, for there is clearly no metaphysical issue with explanations being epistemically incomplete. Thus, if they are to establish any modal conclusion about the nature of grounding and metaphysical explanation, the arguments are best interpreted as metaphysically driven, namely as implying a failure in the metaphysical sufficiency of the explanantia infinitism has on offer. Alternatively, insofar as such explanations are *metaphysical* in nature, the relevant notion of completeness is not purely epistemic. In short, metaphysical explanations are typically seen as a (primarily) objective form of explanation, where this means that there is a mind-independent fact of the matter about what (completely) metaphysically explains what.[12] This should lead us to an analogous assessment of the metaphysical viciousness of the regress.

I submit, therefore, that the charge against infinitism is that of metaphysical insufficiency: without the fundamental facts fully grounding the rest of reality, derivative facts lack the necessary grounding base for their obtaining. I call this version of the argument from vicious infinite regress *the argument from insufficiency*, and in what follows I shall argue that it is unsuccessful. In the remainder, I disambiguate the claim of insufficiency by examining it from two different perspectives on the regress: *the local perspective*, which focuses on the obtaining of the individual derivative facts, and *the global perspective*, which focuses on the obtaining of the entire collection of derivative facts. For each perspective, I argue that the reasons for believing that infinitism cannot provide sufficient grounds are problematic.

4 The Local Perspective

The viciousness of regresses is typically assessed locally, in terms of the explanation of the individual links connecting an element further up the infinite chain with elements preceding it. To illustrate, consider the case of an analogous metaphysical

[11] Cameron deems vicious those regresses where the relation of metaphysical determination has an associated regress of explanation. However, he rejects the idea that grounding must always involve metaphysical explanation (2022, pp. 110–119). I lack the space to discuss Cameron's view in any detail. Hence, I will simply adopt the orthodox view and assume that grounding is explanatory in that it is essentially connected to a metaphysical form of explanation. Note, however, that the cases Cameron has in mind are not examples in which the absence of any explanatory connection is immediately apparent and cannot be resisted, as even he acknowledges.

[12] Commitment to this idea, if not explicit, is largely implicit in much of the literature. See Correia and Schnieder (2012, p. 24), Raven (2013, p. 193), Trogdon (2013, p. 473), Skiles (2015, p. 719), Dasgupta (2017, p. 90), Wilson (2018, p. 725), Roski (2021, p. 1973).

regress: the regress of composition. Imagine a complex object C, that depends mereologically on its proper parts P1, P2, and P3. Suppose further that C is *gunky*—i.e., it is a composite object whose proper parts depend upon further proper parts, and so on ad infinitum. If so, then for each proper part of C, there is a non-terminating chain of composition connecting complex objects down the infinite chain, there being no mereologically fundamental objects or *simples*.

Despite the apparent conceivability of gunky worlds, some metaphysicians have found this regress objectionable, leading them to reject the possibility of gunk (Brzozowski, 2008; Cameron, 2008; Kitamura, 2016; Miller & Hariman, 2017; Williams, 2006). The usual suspicion is that in worlds where objects are gunky, composition could never *get off the ground* (Cameron, 2008, p. 6; see also Leibniz, 1989, p. 85).[13] For one thing, if the existence of every complex object depends on the existence of further infinitely many complex objects, we never arrive at a bottom level that guarantees that any such object could be formed in the first place. The anti-gunk worry, then, is that composition is not possible in mereologically infinite (i.e., gunky) worlds. The conclusion: the compositional regress is locally vicious. For composition to occur, the relevant relation of dependence must be well-founded.

Let us now consider a singular non-well-founded chain of grounding. Applying the local perspective, we get that, that, for each derivative fact D_n in the infinite chain, there is some derivative fact D_{n-1} in that chain such that D_{n-1} precedes D_n and the obtaining of D_n is grounded in the obtaining of D_{n-1}. So, by transitivity, the obtaining of each derivative fact is grounded in an infinite number of more fundamental facts. The foundationalist complaint is that such a chain of grounds is insufficient to guarantee the obtaining of any derivative fact, since the obtaining of any given derivative fact D_n does not depend solely D_{n-1}, but on infinitely many derivative facts further down the chain. But, since this chain of dependence never bottoms out, it seems that we never reach a sufficient ground that can secure the obtaining of any fact. The implication is that in infinitely grounded worlds, reality is never realized as full grounding never takes off (Schaffer, 2016, p. 95). The conclusion: infinitism is not possible; grounding is necessarily well-founded.

Note that the alleged difficulty cannot simply be that every fact depends on an infinite number of other facts. For one thing, this would beg the question against infinitism. Moreover, foundationalism is compatible with the existence of an infinity of derivative facts, so long as those facts are fully grounded in the fundamental facts. Hence, the charge should not be seen as an objection to mere infinite dependence but rather to the *non-well-foundedness* of the metaphysical structure. Recall that a grounding structure is well-founded iff there is a set of facts that fully ground all the derivative facts and that are themselves ungrounded (Dixon, 2016, p. 9; Rabin & Rabern, 2016, p. 363). This brings us back to the argument from insufficiency, since

[13] See Schaffer (2010) for a solution that accepts the possibility of gunk and instead concludes that ontological priority runs from wholes to parts. The conceivability of *junky* worlds, i.e., worlds in which every complex object is a proper part of a larger complex object, has been said to present an analogous problem for this view.

what's at issue is the lack of fundamental facts that are said to be able to provide a sufficient grounding basis for any of the derivative facts.

This advances the discussion. From the local perspective, the foundationalist diagnoses a lack of sufficient grounding for each individual derivative fact. Insufficiency, however, might refer to different things in this context. In the following, I clarify two possible senses of metaphysical insufficiency that might be thought to be at play in the foundationalist critique and explain why they are too problematic to sustain the anti-infinitist argument.

4.1 Two Senses of Insufficiency

One way of unpacking the argument from insufficiency is to say that the grounding regress entails that every derivative fact is merely partially grounded. According to this interpretation, all facts are grounded, albeit on a partial basis which is metaphysically insufficient. From the local perspective, completability is thus said to be violated at every step of the chain.

The immediate problem with this formulation of the argument is that it amounts to the claim that for every derivative fact, the grounds of that fact are made complete iff they are supplemented by the fundamental facts. The idea, then, is that there is no relation of *full derivative grounding*—i.e., a relation of full grounding between facts that are non-fundamental—neither in the scenario where grounding is well-founded, nor where it is not. For what is implied by this interpretation is that, for both the foundationalist and the infinitist, say, [Socrates exists] is only a partial ground for [{Socrates} exists]. It is only once the fundamentalia are added to the set of grounds that we have a full sufficient ground. The questionable conclusion is that the fundamental facts are those facts that alone are apt to complete the grounding basis for the obtaining of any derivative fact.

This is radically at odds with the way grounders typically think about grounding relations. Grounding theorists tend to countenance full grounding among facts that are assumed to be non-fundamental. More importantly, they do so regardless of the question of whether there are any fundamental facts. Consider, in addition to the well-worn case of Socrates and his singleton set, the grounding relations that are said to obtain between [The rose is crimson] and [The rose is red] (Rosen, 2010, p. 126; Schaffer, 2016, pp. 69–70; Trogdon, 2018a, pp. 1291), between [Snow is white] and ['Snow is white' is true] (Fine, 2001, p. 15, 2012, pp. 43–46; Griffith, 2014, pp. 212–213; Schaffer, 2016, p. 78), or between [I am tired], [I am hungry] and [I am tired and hungry] (Rosen, 2010, p. 117; Fine, 2012, p. 50; Schaffer, 2016, p. 79). These are typically advanced as paradigmatic examples of full grounding where some derivative facts are metaphysically sufficient to bring about the obtaining of the relevant groundee.

We can further illustrate the point by focusing on the nature of the explanatory connection. Socrates' existence appears to be entirely sufficient to metaphysically explain the existence of {Socrates}. Nothing remains to be added as far as the metaphysical explanation of *this fact* is concerned. That is, we need not refer to further facts, either prior or ultimate, in the explanatory chain to give a complete

metaphysical explanation of the obtaining of this fact.[14] This is because supplementing the explanans with further facts seems to add nothing to the metaphysical explanation of the existence of {Socrates} (Trogdon, 2013, p. 479). We have reached the strictest form of explanation, we have hit upon that in which the explanandum consists, that which is constitutive of its obtaining (Fine, 2012, p. 32).

The point of drawing attention to these examples, however, is not just that they are true instances of full grounding among derivative facts. Rather, they illustrate what grounding theorists take to be the common ground of the grounding theory. In other words, the interpretation of insufficiency in terms of mere partial grounding runs too great a methodological risk of undermining the very notion of full ground to be plausible. Specifically, it runs the risk of making the distinction between full and partial grounds dependent on the fundamental facts. This is problematic, as one would presume that this distinction should operate independently of one's preferred theory of the structure of reality. I conclude, therefore, that the interpretation of local insufficiency as mere partial grounds is inadequate.

Nevertheless, there may be a more appropriate formulation of the foundationalist critique. Indeed, at this point, foundationalists might accuse us of conflating two senses of insufficiency. They might insist that what they mean by incomplete metaphysical explanations is more properly understood as demanding an *ultimate* metaphysical account of the obtaining of the derivative facts. That is, foundationalists are not necessarily denying that [Socrates exists] fully grounds [{Socrates} exists]. Rather, they argue that without fundamental facts we are unable to acquire a special sort of metaphysical explanation, an explanation in terms of *ultimate grounds*. However, the strength of the argument weakens once we recognize that it is only a disguised demand for the fundamental facts (Bliss & Priest, 2018, pp. 20–21). The assumption that derivative facts must have a metaphysical explanation in terms of some ultimate grounds is the very idea that there must be a certain type of facts which can explain the obtaining of every other fact and which themselves do not admit of any explanation. And clearly, no argument in support of the existence of fundamentalia can rest on such an assumption on pain of begging the question.

One way around this problem can be found in Dasgupta (2016). In invoking a tamed metaphysical version of the principle of sufficient reason, Dasgupta argues that every substantive fact has an *autonomous* ground (2016, p. 384). The distinction between autonomous and fundamental facts boils down to a difference in *bruteness*. Fundamental facts are brute in that they are apt for being grounded but lack a ground; autonomous facts, on the other hand, are not apt for being grounded in the first place. Put differently, the question of what metaphysically explains the obtaining of autonomous facts does not arise as a legitimate question. Dasgupta believes autonomous facts pertain to the essence of things, but other approaches might take other facts to be autonomous.

[14] Recall that I am not talking about epistemic completeness. Some may insist that the explanation leaves agents *unsatisfied* because it does not exhaust the entire explanatory history of the relevant fact (Dasgupta, 2016, p. 383). Yet this is a subjective matter that has nothing to do with any *metaphysical insufficiency* of the explanans.

Unfortunately, such a maneuver will not do. The primary issue with this strategy is that the answer it provides is not exclusive to the foundationalist. Insofar as autonomous facts do not constitute a type of fundamental fact, the infinitist can similarly utilize them to address the challenge of providing an ultimate metaphysical explanation of the derivative facts. To this end, it is sufficient to revise infinitism from its naive definition, which asserts that every fact must be grounded, to a formulation according to which for every fact that is apt to be grounded, there is a ground of that fact.

The foundationalist who is hanging everything on the regress argument is in a difficult position. They must provide a formulation of the argument from insufficiency that convincingly demonstrates that the infinite regress is locally vicious. However, the two available senses of insufficiency are problematic. Interpreting insufficiency in terms of the sole availability of merely partial grounds is not viable, while interpreting it as a claim about ultimate grounds either begs the question or fails to present a challenge. Unless foundationalists can provide a better definition of insufficiency, the argument remains stalled. I, for one, am at a loss to fathom what that definition might be. So, instead, I wish to propose an alternative formulation of the argument that locates the issue of viciousness on a different level.

4.2 Meta-grounds

Having reached this point, foundationalists may agree that the construction of local viciousness in terms of ultimate grounds is dialectically ineffective. They might also accept that there are relations of full derivative grounding. And yet they might reply that *what grounds these grounding facts themselves* are the fundamental facts. In other words, foundationalist might construe viciousness as a meta-grounding claim. This is a much more interesting reconstruction of the argument, one that the foundationalist is in a better position to pursue. Unfortunately, there are at least three ways in which the infinitist might resist.

First, the infinitist could argue, following Litland (2017), that grounding facts are *zero-grounded*. The notion of being zero-grounded differs from that of being ungrounded in that ungrounded facts lack any grounds, whereas zero-grounded facts are said to be grounded in an empty set of facts.[15] Litland develops his response to the meta-grounding challenge in connection with the notion of *non-factive* grounding. While only truths (or obtaining facts) can factively ground, falsehoods (or possible facts) can also flank the grounding relation (Fine, 2012, pp. 48–49). The complexities of the account are many. Suffice it to say that, on his view, non-factive grounding is taken as the primitive relation from which the notion of factive grounding is derived: [φ] is factively grounded in Γ iff, [φ] is non-factively grounded in Γ and all the elements in Γ obtain. With Litland, we can then say that a fact is zero-grounded if there is a metaphysically explanatory argument of that fact following

[15] Fine (2012, pp. 47–48) illustrates the idea with an analogy: we can imagine a machine that produces sets via a 'set-building' relation. If we feed the machine with objects, it will produce sets with corresponding members. However, if no object is fed, it will produce the empty set instead.

from an empty set of premises (2017, p. 280). Litland requires that in arguments of this form all premises be discharged, i.e., they are absorbed, say, into the antecedent of an implication that serves as the conclusion, so that they are no longer assumptions on which the conclusion rests (as in conditional proof). The result is that from Γ we derive [φ] via a metaphysically explanatory argument, thus establishing the conclusion that Γ non-factively grounds [φ], which we can turn into a factive ground by the additional truth that all elements in Γ obtain. Now, given the discharge in the explanatory argument, we get that [Γ grounds [φ]] is non-factively grounded in an empty set of premises or facts.

Some might view the zero-grounding maneuver as a mere technical fix. Additionally, there might be a concern that explanations in terms of nothingness are not genuine explanations, as there can be no explanation without explananda (Wallner, 2021). Yet, the notion of zero-grounding has found successful application in debates concerning the grounds of identity, negative existentials, arithmetic truths, and necessary truths (De Rizzo, 2020; Muñoz, 2020; deRosset & Linnebo, 2023; Kappes, 2024). For our purposes, what matters is that if the notion is coherent, it provides a response to the meta-grounding challenge that avoids the postulation of fundamental facts. But if the infinitist is uncomfortable with the additional theoretical cost this notion adds to their theory, they might opt for an alternative route. Instead, the infinitist could take the essentialist path, arguing that it lies in the essence of at least one of the relata that they be connected by a grounding relation. This strategy comes in two varieties, pulling in opposite directions.

The first version of the strategy consists in arguing that grounding is what Bennett (2011; see also deRosset, 2013) calls a *superinternal* relation. Superinternal relations are such that the intrinsic nature of one of the relata guarantees both that the relation holds and that the other relata exist and have the intrinsic nature that they do. Accordingly, grounding is such that it is in the intrinsic nature of the grounds both that they ground what they ground and that their groundees have the intrinsic nature that they do (2011, p. 32).[16] So, for instance, Bennett claims that an adequate formulation of physicalism has it that the physical facts, in virtue of their intrinsic nature, make it the case that the mental facts are what they are—in particular, that they are grounded in some complex physical facts. One natural way of understanding this claim is to view it as a form of *upward essentialism* (Litland, 2020, p. 137), whereby both the less fundamental facts and the relation that generates them derive from the essential nature of the more fundamental facts. This approach provides a straightforward answer to the meta-grounding challenge, since it is the facts in Γ themselves, in virtue of their essential nature, that grounds [Γ grounds [φ]].

[16] Originally, Bennett claimed that superinternality is the mark of grounding, it is what makes grounding generative (2011, p. 33). However, her views have since evolved (Bennett, 2017). She now believes that grounding is a kind of *building* relation that is *one-sided* rather than superinternal. This allows that some of the extrinsic features of the ground might matter as well when it comes to the obtaining of both the groundee and the fact that the relation holds (2017, p. 194). This does not affect the current discussion, as both superinternality and one-sidedness entail that the relevant relation of determination unfolds upwardly from the intrinsic nature of the more fundamental relata.

The second strategy takes the opposite route, arguing that it lies in the nature of the grounded facts that they be grounded in their grounds. One advocate of this essentialist account is Fine (2012), who has suggested that grounding connections are explained by the essence of the constituents of the grounded facts (see also Dasgupta, 2014; Wallner, 2021). In Fine's own words, "it is the fact to be grounded that 'points' to its grounds" (2012, p. 76). Accordingly, what explains the fact that {Socrates}'s existence holds in virtue of Socrates' existence is something about the nature of {Socrates} rather than Socrates. This supports contemporary top-down approaches to metaphysical analysis, according to which it is by studying the nature of grounded facts that we discover the grounding structure of reality. The solution to the meta-grounding challenge is again given in terms of the essences of facts (or their constituents) and without recourse to the fundamentalia: it is essential facts about the nature of [φ] that ground [Γ grounds [φ]].[17]

One concern here is whether the infinitist is inviting the charge of regress at another level. Even if the infinitist can appeal to essence facts to address the meta-grounding challenge, we are still stuck with the question of what grounds those essence facts. Foundationalists have an easy answer, for they can claim that essence facts are fundamental. But note that the infinitist could argue that essence facts are autonomous, as indicated previously. This circumvents the positing of fundamental facts, since autonomous facts are not the kind of facts for which the question of ground arises. Besides, infinitists can simply claim that what we have is yet another infinite grounding chain, in which facts about essences are grounded in further facts about essences, and so on. Thus, for example, facts about the essence of Socrates are grounded in more fundamental essential facts about the essence of the full grounds of his existence. Nothing so far tells us that essential dependence must be well-founded, it is up to the foundationalist to prove so. Moreover, having essence facts be ungrounded is to multiply the fundamentalia in an unwieldly manner. Consider Schaffer's (2015) arguments that considerations of parsimony apply exclusively to the fundamental facts. According to this line of thought, grounded facts cost nothing by the measure of ontological economy beyond the cost incurred by their full grounds. The problem arises when a given ontology compares poorly to another at its fundamental level. Consequently, theories that treat essence facts as brute will be more costly than accounts that take them to be grounded, other things being equal.

If what I have argued is correct, the infinitist has fewer problems than the argument from insufficiency seemed to suggest. In particular, we have found no conclusive way of establishing that the grounding regress is locally vicious. In the next section, I consider an alternative perspective on the grounding regress that locates

[17] A third and, to my knowledge, underexplored strategy would be to argue that it lies in the essence of *both* relata that one is the ground of the other. An initial challenge that such a strategy would face is that of determining whether it is the *individual essences* or the *joint essence* of both relata that are relevant here. Alternatively, a more eclectic approach would allow that what's relevant may change from case to case: sometimes it's the essence of the ground, sometimes it's that of the groundee, and at yet other times, it's the essences of both.

viciousness at the global rather than the local level. I contend that this too fails to provide conclusive reasons for rejecting infinitism.

5 The Global Perspective

Recently, some authors have suggested that there may be an additional perspective from which a given regress could be considered vicious. Specifically, some philosophers have argued that in some cases of infinite regress, while we may have a full account of the F-ness of each particular element in terms of the dependence of that element on further F-elements in the series, we may still lack a full account of that in virtue of which the whole chain has property F (Aikin, 2005; Bliss, 2013, 2019; Priest, 2014). In such cases we might say that the regress, though (perhaps) locally benign, is globally vicious.

Priest (2014, pp. 186–187) provides the following example: consider an infinite series of objects each of which can be in one of two possible states: active or passive. The state of each object depends on the state of the object preceding it, so that for each object a_n, a_n is active, only if a_{n-1} is active. Priest argues that in this scenario the status of each object is fully accounted for by the status of the preceding object, since nothing about the status of the former object is left unexplained. In other words, the full account of the state of each element is not necessarily compromised by its being dependent upon further elements of which there happen to be infinitely many. However, Priest points out that while we may have a complete explanation of the status of each individual element in the chain, we still lack an explanation of how the chain *as a whole* acquires the relevant status.

Returning to the case of infinitism, the idea is that while we might have a sufficient ground for the obtaining of each derivative fact that belongs to the infinite chain, we may still lack a ground that can account for the obtaining of the entire collection of derivative facts. Let us call this collection Δ, where [Δ exists] is the fact that there is such a collection. The question then is: what grounds [Δ exists]? Before answering, we ought to understand what the nature of Δ is. In what follows, I discuss some conceptions that the foundationalist might utilize.

5.1 Of Grounds and Collections

A first interpretation is to understand the collection as the set of all derivative facts. The foundationalist contention would then be that while each of the infinitely many derivative facts that constitute the set has a sufficient ground, the set itself does not. However, it is common ground among theories of ground that sets are fully grounded in their members.[18] Consider the set of all natural numbers. It should strike us as uncontroversial that the existence of the infinitely many natural numbers

[18] More specifically, this is true of the dominant iterative conception, according to which sets are formed or constituted from previously given elements. This establishes a hierarchy of ontological priority according to which the elements of a set are ontologically prior to the set they form.

fully grounds the existence of the set, the fact that they are infinitely many notwithstanding.[19] The fact that a given set is infinite should not thwart the metaphysical status of its members as sufficient grounds for it.

Another alternative is to treat Δ as an infinitely large conjunction of derivative facts. Yet, similar reasoning applies to the case of conjunctions. Again, the fact that Δ has infinitely many conjuncts should not lead us to doubt the metaphysical sufficiency of those conjuncts as grounds for Δ. The fact that the conjuncts are infinite should be inconsequential to the metaphysical status of the grounding base.

A third interpretation, offered by Oberle (2022), is to construe Δ as a plurality. This allows us to speak of the collection of derivative facts without presupposing that they form a distinct entity. Instead, the foundationalist seeks a ground for the existence of all derivative facts *plurally* taken. Yet Oberle contends that the notion of distributive ground (Fine, 2012, p. 54) allows us to account for the obtaining of the plurality without having to resort to fundamental facts. The basic idea is that whenever Γ distributively grounds Δ, there exists a decomposition of Γ into subsets and a corresponding decomposition of Δ into members, such that the subsets of Γ ground the members of Δ (Oberle, 2022, p. 17). Accordingly, Γ corresponds to the union of the full grounds of each member of Δ, which is simply Δ.

More generally, these interpretations seem prima facie harmless in so far as they require foundationalists to give structurally analogous responses when accounting for the obtaining of the collection of *all facts*, especially if we allow the chain of derivative facts to be upwardly infinite. But even accepting that the chain of grounding will be finite, the only difference in the infinitist response lies in the contrast between the finite and infinite extension of the collection. The core question, then, is whether an infinity of facts can provide a full ground for anything. And there seems to be no principled, non-question-begging reason to doubt that it can.

A more promising construction of the global challenge takes the form of a universal generalization concerning the obtaining of all derivative facts. This can be expressed roughly as follows: $[\forall x(Fx \rightarrow Ox)]$, where F is the property of being a derivative fact and O is the property of obtaining. The reason why this construction of the global regress holds up better is that it is a widely acknowledged problem that universal generalizations do not follow from their instances, in the sense that no number of instances seems sufficient to give a complete metaphysical explanation of their truth. Relatedly, the foundationalist might insist that no number of derivative facts can form a sufficient ground for $[\forall x(Fx \rightarrow Ox)]$. The complaint can get through because it does not hinge in any way on there being infinitely many derivative facts.

Two problems cast a shadow over the prospects of this strategy. The first is that the problem of grounding generalizations is not a problem unique to infinitism. It is a widely acknowledged problem of the theory of ground at large that instances

[19] Some might object that the reason why this set is fully grounded is that the set of natural numbers is *actually infinite*, whereas the set of derivative facts is *potentially infinite*. Two issues weaken the strength of this objection. First, it must be demonstrated that the distinction between actual and potential infinity is relevant to the discussion of metaphysical sufficiency, and that it does not equivocate between different senses of completeness. Second, the proponent must still provide reasons for interpreting the set of derivative facts as a potential rather than an actual infinity.

of universal generalizations do not necessitate their truth (Skiles, 2015). Correspondingly, this is a problem the foundationalist will likewise face when it comes to grounding the universal generalization concerning the obtaining of all facts. Second, recent developments in the grounding literature suggest that this may be a case of mere partial grounds that are nevertheless metaphysically sufficient (Leuenberger, 2020; Trogdon & Witmer, 2021). Indeed, in arguing for the possibility of such cases, Trogdon and Witmer suggest that true restricted generalizations are merely partially grounded (2021, pp. 4–6).

In sum, the problem with the global construction of the grounding regress is that nothing seems to force infinitists to go beyond the collection of derivative facts. In the next section, I discuss one recent attempt to do so by constructing the global regress in terms of a kind instantiation principle. After presenting the interpretation, I raise doubts about the principle motivating the challenge.

5.2 The Externality Assumption

In a recent paper, Bliss (2019) has argued that the way to motivate *the externality assumption*—i.e., the assumption that we cannot give an account of the obtaining of the collection of derivative facts in terms of derivative facts—is to understand the demand contrastively. That is, what we are seeking is a complete metaphysical explanation or ground of the fact that there are derivative facts, *rather than none*. After some discussion, Bliss concludes that the correct way to understand this question is in terms of what she calls the *kind instantiation principle* (KI) which states that where K is any substantial kind, you cannot explain why there are any Ks at all by invoking only Ks (2019, p. 372; see also Maitzen, 2012, 2013).

The argument thus takes the form of a version of the cosmological argument from contingency, according to which no contingent fact can explain why there are contingent facts at all. Consider the example Bliss uses (2019, p. 371): suppose we wanted to know why there are flamingos rather than none, and someone pointed out that there are a certain number of flamingos that were begotten by some previously existing flamingos, which in turn were begotten by other previously existing flamingos. The idea behind KI is that while explaining the existence of individual flamingos in terms of their parents is perfectly fine, citing all instances of pre-existing flamingos amounts to a very bad explanation of why there are any flamingos at all. This points to the requirement of an element external to the collection that can explain why there is a collection. Bliss' argument is that the same is true of derivative facts.

How might infinitists respond? They might argue that derivative facts do not constitute a substantial kind. This is an issue that Bliss herself acknowledges as potentially problematic (2019, pp. 376–377). In short, the point is that 'derivative fact' is not a kind term but a *category term*, failing to capture any substantial kind and instead referring to a higher genus to which various classes of entities belong.[20] Accordingly, the success of the argument hinges on whether

[20] Bliss constructs the argument using the term 'dependent entity', for all matter and purposes the discussion remains the same.

category terms function like kind terms. Both kind and category terms are sortal terms, which include conditions of identity and individuation. Importantly, some philosophers have suggested a distinction between true or substantive sortals and *dummy sortals* (Wiggins, 1967, p. 29; see also Lowe, 2009; Thomasson, 2007). Dummy sortals are terms that, despite their initial grammatical appearance, fail to denote genuine kinds of entities. Put differently, dummy sortals lack a criterion of identity governing the instances that fall under them. If 'derivative fact' is a dummy sortal, then KI cannot be used to support the externality assumption since the term would not identify any substantive kind or category. Indeed, a similar argument has been made by Maitzen (2013), who argued against certain forms of cosmological arguments by claiming that the term 'contingent thing' is a dummy sortal.

Discussions of sortals aside, my problem is with the scope of KI as a general explanatory principle. First, note that KI is essentially a reformulation of the externality assumption in kind terms. Thus, KI alone cannot justify the externality assumption since we still need to determine whether the principle is true. More importantly, like Bliss, proponents of the externality assumption typically point to instances of causal explanation to establish an analogy. But it is not at all clear whether our explanatory intuitions about kind instantiation in causal contexts apply to non-causal instances. My claim about the externality assumption, as motivated by KI, is that it seems correct in the case of causal explanations, where an external explanation in terms of non-K entities is already presupposed. However, we have no reason to believe that the same is true for non-causal explanations.

Take the example Bliss uses. When explaining why there are any flamingos at all, we have prior knowledge that the nature of the biological kind involved entails that flamingos have not always existed. In other words, the causal explanation for the existence of flamingos already presupposes that there must be some pre-flamingo entities that can causally explain the existence of the entire collection of flamingos. This is why citing every instance of a flamingo seems to us to be a very poor explanation. But the same does not seem to follow when dealing with non-causal kinds. Consider a world made up entirely of black tetrahedrons, whose existence depends on the existence of further infinitely many black tetrahedrons. There is nothing in the concept of such objects entailing that there must have been something prior to the collection of black tetrahedrons that can explain their existence. Likewise, nothing in the concept of 'derivative fact' entails that there must be something prior to the collection of derivative facts that explains why there are derivative facts rather than none. All that the concept entails is that the facts constituting the collection are dependent on further facts that are necessary for their obtaining. In short, intuitions about kind instantiation break down once we are dealing with a metaphysical, non-causal type of explanation. To insist that there must be items external to the collection that can non-causally explain that there are such items, solely on the basis of intuitions about kind instantiation in causal contexts, is to credit those intuitions with more probative force than they can have.

6 Conclusion

Metaphysicians have long favoured foundationalist accounts of metaphysical structure, yet the task of pinpointing exactly what is wrong with infinitism has proved difficult. In this article, I have argued that one of the main criticisms foundationalists level against infinitism, the argument from infinite vicious regress, is unsuccessful. I have argued that a proper interpretation of the argument frames the charge against infinitism in terms of metaphysical insufficiency: without fundamental facts fully grounding the rest of reality, derivative facts lack the necessary grounding base for their obtaining. I then analyzed two perspectives from which the grounding regress can be said to be vicious and argued that, in neither case, has the foundationalist proved that infinitism is an impossible view of the metaphysical structure of reality.

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Conflict of Interest The authors declare that they have no conflict of interest.

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