dialectica

Vol 77 : 4
December 2023

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doi:10.48106/dial.v77.i4.03

Donnchadh O'Conaill & Olley Pearson. 2023. "Infinite Regresses, Ground Conditions & Metaphysical Satisfaction." *Dialectica* 77(4): 1–1. doi:10.48106/dial.v77.i4.03.

EUROPEAN SOCIETY FOR ANALYTIC PHILOSOPHY

Infinite Regresses, Ground Conditions & Metaphysical Satisfaction

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In this paper we clarify a regress argument for metaphysical foundationalism, distinguishing strong and modest versions of this argument. We suggest that while the strong version is open to objection, the modest version is much more plausible and it supports a methodological stance: one ought to refrain from assuming that anti-foundationalism is metaphysically possible. This modest stance follows from our argument that currently we lack reasons to believe anti-foundationalism is possible. This stance opens a new topic in the debate between foundationalism and anti-foundationalism, placing a burden on the anti-foundationalist to provide reasons to think that anti-foundationalism is possible.

A well-known version of metaphysical foundationalism holds that the universe must have a fundamental level, a collection of entities on which all other entities depend and none of which is itself dependent upon anything else for its existence. To deny this, it has been argued, is to set up a vicious regress of dependent entities (e.g., Leibniz 1989, 149–150, 217–218; Fine 1995, 286; Schaffer 2010, 37). However, this vicious regress argument has come under increasing criticism. Whether or not the argument succeeds depends on whether or not the regress in question is vicious, and, notoriously, proponents of vicious regress arguments often simply assert this to be the case (for discussion see Maurin 2007; Bliss 2013).

In this paper, we shall consider one kind of regress. While we do not think it establishes foundationalism, we shall argue that it shows that anti-foundationalism fails a plausible principle of metaphysics, the Principle of Satisfaction: a fact which cannot obtain unless its ground conditions are satisfied should not be assumed to be possible unless there is reason to believe that those conditions can be satisfied.[1] Those who find such a principle plausible

1 The notion of ground conditions shall be defined in the next section.

should be moved by the regress argument to what we term *modest foundationalism*: one ought to refrain from assuming that anti-foundationalism is metaphysically possible. (To be more precise, we shall largely discuss scenarios, each of which contains only a single maximal[2] grounding chain. Therefore, in what follows, by modest foundationalism and anti-foundationalism, we specifically mean modest foundationalism and anti-foundationalism with regard to scenarios of this form, unless otherwise specified.)

In § 1, we introduce the debate and some terminology. In § 2, we present a version of the regress argument that relies on a strong generalising claim from each member of the regress to all of the members of the regress. In § 3, we present a more modest version of this generalising claim and use it to develop a modest version of the argument, supporting an epistemic claim. This epistemic claim in turn supports the methodological claims that anti-foundationalism fails the Principle of Satisfaction and so modest foundationalism ought to be adopted. In § 4, we briefly discuss more complex grounding structures, ones containing multiple maximal grounding chains.

1 Definitions

The dispute between foundationalists and anti-foundationalists has been discussed in terms of a number of different relations (see Tahko 2023). We shall consider this dispute in terms of grounding, following much of the recent literature (e.g., Schaffer 2010; Bliss 2013; Morganti 2014; Dixon 2016; Rabin and Rabern 2016; Trogdon 2018). We shall adopt an orthodox view on which grounding is an irreflexive, asymmetrical, and transitive relation that holds between facts: for the fact that f to be grounded by the fact that g is for f to obtain in virtue of the obtaining of g (hereafter $g < f$).[3] We shall work with a notion of grounding as *partial*, in the sense that it can include both full grounding and merely partial grounding. A full ground for f is by itself sufficient for f to be grounded (Fine 2012, 3); a merely partial ground for f is not.

We understand foundationalism as follows:

2 This will be defined in the following section.

3 Each of these formal features has been questioned, e.g., in Rodriguez-Pereyra (2015); for a defence, see Raven (2013). We shall formulate grounding claims using relational predicates, e.g., f is grounded by g; for discussion of predicational and operational formulations of grounding claims, see Correia and Schnieder (2012, 10–12).

> FOUNDATIONALISM. Every non-fundamental fact f is fully grounded by some fundamental fact g or facts, Gs (Dixon 2016, 446; see also Rabin and Rabern 2016, 366).
>
> f is *fundamental* $=_{df}$ there are no Gs such that f is partially grounded by any G (Dixon 2016, 442).

We shall also use the notions of grounding chains and maximal grounding chains, which we define as follows:

> A *grounding chain* $=_{df}$ a group of facts, each member of which either grounds or is grounded by each of the other members.
>
> A *maximal grounding chain* $=_{df}$ a grounding chain such that it is not the case that there is a fact that grounds each member of the chain.[4]

It is common to think that some entities are subject to necessary conditions. For instance, plausibly non-empty sets exist only if their members exist; an entity is red only if it is coloured; and an entity is a cube only if it has six sides. In some such cases, the condition is *satisfied* (for instance, each red postbox is coloured); in others, the condition might not be satisfied (for instance, the non-empty set of unicorns does not exist). We believe that all grounded facts are subject to a specific kind of necessary condition concerning their grounds: a grounded fact can obtain only if there obtains some fact or facts that ground it.[5] To capture this idea, we shall now introduce two concepts that will be crucial to our argument in this paper:

> C is a *ground condition for* f $=_{df}$ C is a necessary condition for the obtaining of f, which can only be satisfied by the obtaining of facts that ground f.[6]

4 This definition follows Dixon (2016, 453), and Rabin and Rabern (2016, 364).

5 We think that this is a plausible assumption (though in contrast with Wildman 2018). If this assumption turns out not to be true of all grounded facts, our argument can be read as applying to just those grounded facts for which it is true. This highlights a hitherto undiscussed potential anti-foundationalist response to the regress argument, namely, to try to argue that, although the facts involved in the regress are each grounded, some of them do not require grounds in order to obtain.

6 f may have necessary conditions other than its ground conditions. In what follows, we set these other necessary conditions aside. We use the term 'fact' non-factively. Thus, we characterize

doi: 10.48106/dial.v77.i4.03

> D is a *total ground condition for* $f =_{df}$ (a) D is a ground condition for the obtaining of f, and (b) there is no condition E that is neither identical to nor a proper part of D and which is a ground condition for f.

We shall not provide a metaphysics of necessary conditions or, hence, of the part-of relation between such conditions. However, instances of these relations holding between grounding conditions can be identified via the satisfiers of those conditions, namely, the grounds of certain facts.[7] A ground condition for the obtaining of f, C*, is a proper part of a ground condition for the obtaining of f, C, iff all the grounds of f that satisfy C* are among the grounds of f that satisfy C, and not vice versa. (The ground condition for the obtaining of f, C, is identical with a ground condition for the obtaining of f, C*, if and only if the grounds of f that satisfy C are all and only the grounds of f that satisfy C*.)

To illustrate these definitions, consider first *h*, the fact that A and B exist. *h* is grounded by *g*, the fact that A exists, and *h* cannot obtain unless *g* obtains. We can describe this case by saying that the obtaining of *g* is a necessary condition, or more specifically, a *ground condition*, C, for the obtaining of *h*, and conversely, that the obtaining of *g* *satisfies* the ground condition C. Now consider *i*, the fact that A or B exists. *i* cannot obtain unless either *g*, the fact that A exists, obtains and grounds *i*, or *j*, the fact that B exists, obtains and grounds *i*. We can capture this by saying that *i* has a ground condition C** that can be satisfied by either the obtaining of *g* or of *j*. Note that unlike C*, the satisfaction of C** does not require the obtaining of any specific fact; it just requires the obtaining of either *g* or *j*. Another difference between these two examples is that C** could be a total ground condition for *i*, but C* could not be a total ground condition for *h*, as *h* also requires the obtaining of *j*, the fact that B exists.

A fact that does not have a ground condition does not stand in need of being grounded; it can obtain without there being any facts that ground it. We assume that all such facts are fundamental facts.

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ground conditions as concerning *the obtaining of* facts (though for ease of presentation, we will occasionally drop this phrase and speak simply of *conditions for facts* and of *facts satisfying* those conditions).

7 The obtaining of *g* or the Gs satisfies the ground condition, C, for the obtaining of f, if C is the condition that necessarily f can obtain only if *g* or the Gs obtain and *g* or the Gs ground f, and if *g* or the Gs do obtain and do ground f.

If D is *f*'s total ground condition, then *f* stands in need of ground (since it has ground conditions), and if D is satisfied, then *f*'s need for ground is completely met; *f* can obtain without any further grounds of it obtaining.

To further clarify the notion of a total ground condition, it is useful to contrast it with a more familiar notion that we have already mentioned, that of a full ground. To draw this contrast, suppose *f* is the fact 'Some human exists'. We assume that *f* is fully grounded in each of its instances. *f* thus has multiple full grounds, but it has only a single total ground condition. It might be thought that *f*'s total ground condition could be satisfied by any one of *f*'s full grounds, but whether or not this is so depends on further considerations. Consider fact *g*, the fact that Greta Thunberg exists, and suppose that *g* is not itself grounded. In that case, *f* would be fully grounded in *g*, and *g* would satisfy *f*'s total ground condition. But now suppose that *g* is itself grounded, e.g., in certain biological facts. In that case, *g* could not by itself satisfy *f*'s total ground condition. This suggests a second contrast between a full ground and a total ground condition. While a full ground for a fact *f* is sufficient for *f* to be grounded, that full ground might itself be unable to obtain unless itself grounded by further facts, in which case *f* itself could not obtain unless these further grounds obtain.[8] In contrast, if *f*'s total ground condition is satisfied, no other facts need obtain in order for *f* to obtain.

The reason for introducing the notions of ground conditions and total ground conditions is that they allow us to focus on what is really at stake in the regress argument—not which grounds a certain fact is posited as having, but which grounds a fact needs in order to obtain. Consider the following toy example: $h < g < f$. In this example, *f* is posited as having grounds, and these grounds (*g* and *h*) together satisfy a ground condition for *f*, which we can term C*. The question is whether any other facts are needed in order for *f* to obtain—or, put another way, whether or not C* is a *total* ground condition for *f*. Whether it is will depend on further information about this example. For instance, assume that *h* itself has a ground condition. If this ground condition was not satisfied, then *h* would fail to obtain, in which case C* would not be satisfied and *f* could not obtain. Therefore, the ground condition for *h* is also

8 Note also that if a scenario is stipulated as containing a full ground for *f*, it does not follow that this scenario is possible, since it does not follow that *f*'s total ground condition is satisfied in this scenario.

doi: 10.48106/dial.v77.i4.03

a ground condition for f, and C* could not be a total ground condition for f since f has a ground condition in addition to C*.[9]

2 The Strong Argument

In this section, we shall describe a vicious regress argument against anti-foundationalism, which we shall term the *strong argument*. More specifically, it is an argument against anti-foundationalism regarding any scenario in which each fact belongs to just one maximal grounding chain. Having outlined the strong argument, we shall state why we do not accept it, and in the following section, we shall put forward a different, more modest argument.

Both the strong argument and the more modest argument make use of a certain procedure, which we introduce as follows: Consider a scenario in which a fact, f, obtains. If f has a ground condition, then, in order for f to obtain, some other fact or facts must obtain and ground it. Suppose that f is grounded in g, a fundamental fact, and in no other fact. g satisfies f's total ground condition; therefore, no other facts need obtain in order to ground f. Now suppose f is grounded in a non-fundamental fact, g_1. f's total ground condition is not satisfied by g_1, since g_1 itself stands in need of ground. If g_1 is grounded in a fundamental fact, g_2, then g_2 can satisfy g_1's total ground condition, and g_1 and g_2 can together satisfy f's total ground condition.

In what follows, we shall speak of a fact's total ground condition being satisfied *at a point on a chain*, where to say that f's total ground condition is satisfied at a point on a chain, g_n, is to say that f stands in a grounding chain with g_n such that g_n and the facts in the chain which it grounds and which ground f together satisfy f's total ground condition. In the above scenario with f, g_1, and g_2, f's total ground condition is satisfied at g_2.

What we have said so far suggests a procedure that can be applied to any fact f that stands in need of ground and belongs to a single maximal grounding chain: we can go down the chain looking for a point at which f's total ground condition is satisfied. If the chain contains a fundamental fact, g_n, then f's total ground condition will be satisfied at that point on the chain. However, if none of the facts that ground f is a fundamental fact, then f's ground

9 If we further assume that g and h are each full grounds of f, this example makes clear how a single full ground of f may not be itself sufficient to satisfy f's total ground condition. For instance, g would be sufficient to ground f insofar as, if g obtains, nothing else is needed to ground f. But in the scenario just described, g cannot by itself satisfy f's total ground condition because g, and hence f, can only obtain if h does.

condition cannot be satisfied at any point on this chain. This is because any point on the chain will be such that the fact located at that point has ground conditions not satisfied at that point, and those ground conditions will also be ground conditions for f, which are hence also not satisfied at that point. Thus, in such a chain, there is no fact, g_n, such that g_n and the facts that it grounds can together satisfy f's total ground condition. This point holds even if f stands in an infinitely descending maximal chain of grounding.

The next step in the strong argument is the crucial one, and also potentially the most problematic. This is a *generalising claim*, from the preceding claim about each of the facts that ground f to a general claim about them all together. The strong argument makes use of the following:

> The Strong Generalising Claim (Strong Claim). For any grounding chain, if a fact's total ground condition cannot be satisfied at any point in that chain, then it cannot be satisfied by the facts in that chain at all.

Given the Strong Claim, it is not possible for f's total ground condition to be satisfied by the facts in an infinitely descending grounding chain. The same is true for any member of such a grounding chain: there is nothing unique about f in this example. It follows that no such chain is possible. Therefore, any scenario in which each fact is a member of just a single maximal grounding chain must be such that each maximal chain contains a fundamental fact that grounds each member of the chain.

Something like the Strong Claim is found in other vicious regress arguments for foundationalism. For instance, Anna-Sofia Maurin argues that a regress is vicious if the direction of the regress follows what she terms the direction of dependence:

> The regress is vicious because the trigger, to exist (or, the triggering statement, to be true) requires, first, that step one exists (or, is true), which, in turn requires that step two exists (or, is true), etc. *ad infinitum*. The existence of the trigger will therefore depend on the existence of some "final" step of the regress—a step that will never exist given that the regress is infinite. (Maurin 2007, 21)[10]

10 The trigger is whatever starts the regress, e.g., the obtaining of f in the procedure outlined earlier in this section.

doi: 10.48106/dial.v77.i4.03

In our terms, we can reconstruct Maurin's argument as follows: If a certain fact (the trigger) has a ground condition, it can only obtain if its immediate ground obtains; its immediate ground can only obtain if *its* immediate ground obtains; and so on. And (this is the STRONG CLAIM) the trigger can only obtain if there is a final step in the regress, a fact that has no ground condition. Both the strong argument and Maurin's argument seem to involve a conditional assumption of the following form: if a certain condition cannot be satisfied at any point in the chain, it cannot be satisfied by the facts in the chain at all.

We shall not rely on the STRONG CLAIM in what follows. In effect, it amounts to the following: the facts that together satisfy f's total ground condition must be located at some point in the chain. That is, if the chain of facts is possible, then at some point in the chain there should be a fact, g_γ, which is such that g_γ and the other members of the chain between it and f together satisfy f's total ground condition. But to assume this is to beg the question against the anti-foundationalist. This is because the kind of chain the anti-foundationalist describes—a grounding chain containing an unbounded infinity of members—is structured in such a way that no member of it could possibly satisfy the description of g_γ we have just given.[11] It may be, of course, that the STRONG CLAIM turns out to be correct. But dialectically, it carries little force against the anti-foundationalist. For the strong argument to work, the STRONG CLAIM must be supported by an independent argument.[12]

3 The Modest Claim and the Principle of Satisfaction

In this section, we turn to a different version of the regress argument, which we term the *modest argument*. It utilises the following claim:

11 A similar point is made in Bliss (2013, 407–408).

12 It is important to note that the demand for the satisfaction of a total ground condition is not a demand that a chain has a fact like g_γ or a termination point. A termination point is a member of the chain that grounds all other members of the chain and that is itself ungrounded, i.e., a fundamental fact. It is clear that a chain containing a termination point can satisfy a fact's total ground condition. But the definition of a total ground condition leaves open the possibility that such a condition could be satisfied by an unbounded infinite chain of grounds: in that scenario, each member of the chain after a given fact, f, would satisfy a ground condition of f, and f would have no other ground condition that needed to be satisfied. (It may turn out to be the case that a chain cannot contain a total ground condition unless it terminates—but this is a substantial further claim, one that, in effect, the strong argument is an attempt to justify. We do not assume that the facts in a chain cannot satisfy a fact's total ground condition unless the chain terminates, and we contend that the strong argument does not succeed in establishing such a claim.)

> The Modest Generalising Claim (Modest Claim). For any grounding chain, if a fact's total ground condition cannot be satisfied at any point in that chain, then we lack reason to believe that it can be satisfied by the facts in that chain at all.

The Modest Claim is very plausible. As we argued in section 2, in a chain with no fundamental fact, f's total ground condition cannot be satisfied at any point in the chain. We accepted at the end of the previous section that it does not straightforwardly follow from this that f's total ground condition cannot be satisfied in this scenario. But we have no reason to believe that it *can* be satisfied, because it is not clear what else there is in this scenario to which the anti-foundationalist can appeal in order to satisfy f's total ground condition.[13] (Note, our claim is not that it is impossible to provide such reasons, but that after a careful consideration of a putative anti-foundationalist ontology, as yet none are forthcoming.)

We anticipate two responses to the Modest Claim. The first is that it overlooks the possibility of appealing, not to *any* specific point on the chain, but to *all* of the facts in the chain together (or more specifically, to all of the facts in the chain, each of which grounds f). In other words, the suggestion is, the Modest Claim commits something like a fallacy of composition: moving from a true claim about each member of the chain to a false claim about all members of the chain.

This response would work against the Strong Claim (indeed, it is very similar to the criticism of the Strong Claim we offered at the end of the previous section). But it is not convincing as a response to the Modest Claim, precisely because the latter is a weaker claim. The Modest Claim, to repeat, is that we lack reason to think that the facts in the chain can together satisfy f's total grounding condition. In other words, to affirm the Modest Claim is not to rule out that all of the facts in the chain are together able to satisfy f's total grounding condition; it is to claim that we have no reason to think that all of the facts in the chain are capable of doing so. It is true that claims about all of the facts in the chain are logically distinct from claims about any of the facts in the chain, but this truth does not by itself provide reason to think that all of the facts in the chain can together satisfy f's total grounding condition. To undermine the Modest Claim, the anti-foundationalist requires something more than this logical difference; she owes us a reason to think that there

13 The same will be true of any member of such a chain, as there is nothing unique about f here.

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is an *ontological* difference, i.e., that all the facts in the chain together can satisfy f's total ground condition. (More precisely, she owes us an argument that this is possible as opposed to simply stipulating that it is, since such a stipulation would beg the question in favour of anti-foundationalism.)

A second response to the MODEST CLAIM might appeal to the point that every fact in an infinitely descending chain has a full ground; in such a chain, every fact needing a ground has one, so all total ground conditions must be satisfied. But this response is inadequate. As was mentioned in footnotes 8 and 9, that a postulated scenario contains a full ground for a fact f does not entail that it contains facts adequate to satisfy f's total ground condition. Therefore, one cannot directly argue from the claim that every fact in a maximal chain has a full ground to the conclusion that every fact in this chain has its total ground condition satisfied. For it to be clear that a scenario is one in which the total ground condition for f was satisfied, it would have to be clear that in this scenario none of f's ground conditions was not satisfied. But this does not follow from the fact that in the scenario some of f's ground conditions are satisfied (which is all that straightforwardly follows from each fact having a full ground).

The *modest argument*, as we shall refer to it, combines the MODEST CLAIM with the claim defended in the previous section that f's total ground condition cannot be satisfied at any point in the chain. Together, these claims support an epistemological conclusion: we lack reason to believe that f's total ground condition can be satisfied by the facts in the chain. As noted above, it would be a mistake to infer from this that anti-foundationalism is false. But one can infer a more modest methodological conclusion:

> MODEST FOUNDATIONALISM. One ought to refrain from assuming that anti-foundationalism is metaphysically possible.[14]

MODEST FOUNDATIONALISM follows from the modest argument via the following methodological principle:

> THE PRINCIPLE OF SATISFACTION (PS). A fact that cannot obtain unless its grounding conditions are satisfied should not be assumed

14 Again, we are limiting ourselves for the time being to scenarios with only a single maximal grounding chain. We discuss scenarios containing multiple maximal chains in section 4.

> to be possible unless there is reason to believe that those conditions can be satisfied.[15]

We shall not be able to provide a thorough defence of PS, but we shall outline a general motivation for accepting it. Whilst it can be appropriate to assume that certain facts are possible, the obtaining of a grounded fact is conditional on certain necessary conditions, specifically its ground conditions, being satisfied. PS spells out an approach that one ought to take towards the possibility of such facts in light of their having ground conditions.

To see how this works, consider an example that does not obviously involve issues to do with non-well-foundedness: the possibility that the singleton set {Pegasus} exists.[16] Call the fact that {Pegasus} exists f.[17] It seems plausible that if f would obtain, it would be grounded in the fact that Pegasus exists, and furthermore, unless Pegasus existed, f's total grounding condition could not be satisfied. Applying PS, we suggest that one should not accept that f is possible unless one has reason to believe that it is possible that Pegasus exists. This seems like a perfectly reasonable approach to take. Conversely, it seems unreasonable to accept that f is possible if one has no reason to believe that it is possible that Pegasus exists.

Consider another example: the possibility that some humans are immortal. Call the fact that some humans are immortal g. One might think that if g obtains, it would be grounded by one or more of its instances, i.e., by the fact that a specific human, Nigel, is immortal (call this fact h). But in order for this to provide a reason to think that g is possible, we surely need some reason to think that h is possible. If we have no such reason, then it is surely unreasonable to justify the thought that g is possible by postulating g's being grounded in h. Alternatively, one might think that if g obtains, it would be grounded in, e.g., certain biological facts; but again, without any reason to think that these biological facts are themselves possible, it seems unreasonable

15 As Bliss (2013, 415) notes, it might be possible to motivate a regress argument against anti-foundationalism using a Principle of Sufficient Reason (PSR). It is worth noting that PS is much more modest than a PSR. Whilst a PSR demands that everything in a scenario requires an explanation, PS only says that, regarding entities that we have reason to believe are impossible unless certain conditions are met, we ought not to postulate these entities in a scenario unless we have reason to believe that those conditions can be met in that scenario.

16 Thanks to two referees for suggesting this example and, more generally, for suggesting that we need to spend more time motivating PS.

17 Recall that we are using a non-factive conception of facts, so we are not committing ourselves to f's actually obtaining or even to its being metaphysically possible.

doi: 10.48106/dial.v77.i4.03

to think that g is possible. PS is in effect a generalisation of these specific claims: if you think that a fact has grounding conditions, and if you lack reason to think that any of the facts that would ground it are possible, then you should refrain from accepting that this fact is possible.[18]

PS is a claim concerning modal epistemology, specifically regarding whether or not we should accept that certain scenarios are metaphysically possible. A thorough analysis of PS would require discussing how it relates to various existing approaches in modal epistemology.[19] We shall not be able to address this topic in the detail it deserves, but we shall consider how PS relates to one well-known approach: appeals to conceivability. Again, it will help to start with a toy example that does not involve non-well-foundedness: whether or not it is possible for pigs to fly. One way to address this is to ask whether or not this scenario is conceivable, and a simple claim is that if it is conceivable (or conceivable in a certain way), then we have reason to think that it is metaphysically possible.[20] On the face of it, this approach does not require applying PS and indeed even seems to rule it out (whether a grounded fact, f, is possible would simply be settled by whether we could conceive f itself).

However, even if it is true that PS does not align straightforwardly with the conceivability approach, it is not necessarily at odds with it. To make this clear, assume that the fact that there is a flying pig (call this fact f) has a ground condition (if it does not, then PS would not apply to it). Given this, for the scenario conceived of to be metaphysically possible, it must contain facts that ground f and that together satisfy f's total ground condition (this is something that even the conceivability theorist should be willing to accept).

PS entails that we should not regard this scenario as possible unless we have some reason to believe that it contains facts that satisfy f's total ground condition. Whether or not this restriction is compatible with the conceivability approach will depend on how demanding a notion of conceiving is appealed to. Suppose that conceiving of a scenario only justifies one in thinking that it

18 Note that PS leaves open what can count as a reason to accept that a fact's grounding conditions can be satisfied. This is not a problem. PS is not intended to be a method for discovering which scenarios are (or are not) metaphysically possible. Rather, it is intended as a constraint to be applied to claims that certain scenarios are possible. As a comparison, consider appeals to testimony. As a general rule, one should not accept testimony as a reason to believe p unless the testimony is from a reliable witness. This seems to us to be a perfectly good epistemic rule, but it leaves open exactly what standards must be met in order for someone to be a reliable witness.

19 Thanks again to two referees for suggesting that we engage with this literature.

20 There are a number of different ways of conceiving a scenario (Chalmers 2002). In what follows, the differences between them will, for the most part, not be relevant.

is possible if one conceives of it in exhaustive detail. PS is perfectly compatible with this kind of appeal to conceivability: a clear conception of how the facts in a scenario satisfy *f*'s total ground condition would qualify as a reason to think those facts can satisfy its total ground condition. Suppose, on the other hand, that conceiving a scenario is supposed to justify one in thinking it is possible, even if one's conception omits or glosses over many important details of the scenario. This kind of appeal to conceivability may not be compatible with PS. However, we suggest there is an independent reason to be sceptical of this kind of appeal to conceivability. One well-known advocate of such scepticism is Peter van Inwagen, who notes that "to assert the possibility of *p* is to commit oneself to the possibility of a whole, coherent reality of which the truth of *p* is an integral part" and suggests that conceivability theorists often do not examine the details of such proposed realities (1998, 78). It has also been argued that conceivability is not a reliable guide to possibility insofar as it involves simply stipulating certain features of the conceived scenario (e.g., Kung 2010; Berto and Schoonen 2018). While we shall not defend these more sceptical approaches to conceivability in any detail, they illustrate that there is existing work on modal epistemology that is at least compatible with PS.[21]

An anti-foundationalist may respond that all the modest argument shows, even in conjunction with PS, is that if one is going to assume that a possible world contains a grounded fact, one must also assume that it contains everything necessary to satisfy that fact's total ground condition. To this end, she might add an assumption to her position: a maximal grounding chain contains all of the facts needed to satisfy *f*'s total ground condition.

However, this response is inadequate. What is precisely at issue is whether or not the total ground condition for a fact is satisfied by the facts in a specific kind of chain, e.g., an infinitely descending maximal grounding chain. We submit that the anti-foundationalist is not entitled to assume that they are without further argument. We have already provided reasons to think that *f*'s total ground condition cannot be satisfied at any point in an infinite grounding chain, and as argued above, it is not clear what else in the chain could satisfy *f*'s total ground condition. Therefore, the anti-foundationalist needs to provide some reason to think that the facts in such a chain would contain facts capable

21 We accept that not everyone will be satisfied with our discussion of how PS relates to existing work in modal epistemology; in particular, someone who thinks there are independent reasons to accept appeals to conceivability may be tempted to reject PS on this basis. Our defence of PS can therefore be understood as conditional: one should accept PS unless one already has reason to accept an approach in modal epistemology that undermines it.

doi: 10.48106/dial.v77.i4.03

of satisfying *f*'s total ground condition. Until such further reason is provided, we ought to refrain from assuming that *f*'s total ground condition would be satisfied by any or all facts in such a chain. And this leads immediately to refraining from assuming that such a chain is possible.

Combining PS with the modest argument leads us to Modest Foundationalism. Modest Foundationalism does not entail the falsity of anti-foundationalism. Rather, it is a methodological stance towards anti-foundationalism; one should not assume that anti-foundationalism is either actually or possibly true. This stance is open to revision, but the burden lies with the anti-foundationalist to provide some positive reason to think that what she is describing is metaphysically possible (we have argued that currently we are lacking any such reason).[22]

4 Other Grounding Structures

The argument we have given so far establishes Modest Foundationalism for scenarios in which each fact belongs to a single maximal grounding chain. We believe that essentially the same argument can be given for scenarios where facts belong to multiple maximal grounding chains. We do not have adequate space here to make this more general argument, but in this section, we will say something to indicate what form it would take.

The argument we have given for facts belonging to single maximal chains works by establishing that at no point in such a chain will we locate grounds adequate to satisfy a fact's total ground condition: call this claim Single. The argument then moves from Single via the Modest Generalising Claim and PS. To make the more general argument, we need an analogue of Single for complex structures where facts belong to more than one maximal grounding chain. We propose the following: at no level in such a structure will we locate grounds adequate to satisfy a fact's total ground condition (where a level simply consists of one point on each of the maximal chains to which the fact belongs).[23] We will refer to this claim as Complex. We would also

22 Cameron (2008, 12–13) also argues for a position more modest than foundationalism as usually understood, and he also utilises a methodological principle; but his position and the principle he uses each differ from ours. Cameron's argument is essentially that we ought to take the actual world to be foundationalist because it permits unified explanations. Our argument is that we ought not to assume that any possible world is anti-foundationalist, because we lack reason to believe that anti-foundationalism can satisfy any fact's total ground condition.

23 The notion of a level allows for the concern that we might need to consider points on more than one maximal chain to locate facts adequate to satisfy a fact's total ground condition. Our talk of a

need an analogue of the MODEST CLAIM, and we propose the following: for any grounding structure, if a fact's total ground condition cannot be satisfied at any level in that structure, then we lack reason to believe that it can be satisfied by the facts in that structure at all. We will refer to this as the SECOND MODEST CLAIM.

In order to establish MODEST FOUNDATIONALISM for complex structures, we would try to establish COMPLEX and move from it via the SECOND MODEST CLAIM and PS. We would hope to justify the SECOND MODEST CLAIM much as we have justified the MODEST CLAIM: it is not clear what else could satisfy the total ground condition of a fact in such a structure other than the levels in the structure.

Whilst we can't argue for COMPLEX here, we believe that it is actually a claim that many anti-foundationalists would be willing to accept. This is because it seems the most apt anti-foundationalist scenarios would include continuous grounding series, and such continuous series are specifically ones where we do not locate total ground conditions at any level.

Before closing this section, we will briefly consider three complex grounding structures in order to show how our arguments apply to them. We do not intend this to establish the general argument but to indicate how it can handle specific kinds of complex grounding structure.

In the first scenario, f is fully grounded in a fundamental fact, g. f is also fully grounded in h_1, which is fully grounded in g and also fully grounded in h_2. h_2 is fully grounded in g and also in h_3, etc. That is, the Hs form an infinite descending chain of grounding such that each of the Hs, h_δ, is itself fully grounded in g as well as in the subsequent H, $h_{\delta+1}$. The facts in this scenario together form a *fully pedestalled chain* (Dixon 2016, 447–448).[24] This kind of grounding structure should be acceptable to a foundationalist because each non-fundamental fact in it is fully grounded in a fundamental fact, g.

The generalised argument concerning complex structures that we outlined above accommodates this scenario. Starting with f, our argument requires that we must be able to locate a fact or facts adequate to satisfy its total ground condition at some level in the structure. We can easily do this. In particular, g can satisfy f's total ground condition. To see this, we can note

level should not be taken to imply that facts adequate to satisfy a fact's total ground condition must be satisfied by some point on *each* maximal chain.

24 All of the facts in this scenario belong to a single maximal chain. However, f also lies on multiple maximal chains in the structure (e.g., $g < f$, $g < h_1 < f$, etc.), so it counts as complex and relevantly different to the scenarios discussed previously.

doi: 10.48106/dial.v77.i4.03

that g is sufficient for f to be grounded and g does not itself have any ground conditions, so the ground condition for f that is satisfied by g is a total ground condition for f.[25] Therefore, any level in the structure that includes g will be a level at which we can locate facts adequate to satisfy f's total ground condition. Furthermore, the same holds for each of the other non-fundamental facts in the scenario, i.e., each of the Hs. For example, g can satisfy h_1's total ground condition in a way analogous to that in which it satisfies f's. Thus, COMPLEX does not arise in this scenario, and so our argument does not stand against it.[26]

In the second scenario, f is the fact that A exists or B exists. f belongs to two maximal grounding chains. The first is $g < f$, where g is the fact that A exists. The second is $\ldots < i_3 < i_2 < i_1 < f$, where i_1 is the fact that B exists, i_2 is a fact that fully grounds i_1, i_3 fully grounds i_2, etc. g is fundamental and stands in no grounding relation with any of the Is.

Focusing on f, our generalised argument requires that we must be able to locate facts adequate to satisfy its total ground condition at some level in the structure. And it would seem that we can do this. As above, it seems g can satisfy f's total ground condition.

However, while we can locate grounds adequate to satisfy f's total ground condition, this is not true of any of the other non-fundamental facts in the structure. For example, i_1 lies on a single maximal chain of grounding, which contains no fundamental fact. Thus, a variant of COMPLEX arises in this second scenario, and our argument applies against it, as the foundationalist would want.

In the third scenario, f is merely partially grounded in a fundamental fact, g. f is also merely partially grounded in h_1, and together g and h_1 fully ground f. h_1 is merely partially grounded in g and merely partially grounded in h_2, and together g and h_2 fully ground h_1. h_2 is in turn merely partially grounded

25 We do not intend our comments in the sentence to generalise; that is, we are not implying that in any scenario whatsoever, any fact that is fundamental and a full ground of f will satisfy f's total ground condition. For example, consider an adjusted first scenario, which is as the first scenario except g is fully grounded in g_1, which is fundamental. In the adjusted first scenario, g_1 would not satisfy f's total ground condition. However, g_1 would satisfy g's total ground condition, and hence g_1 and g together would satisfy f's total ground condition. Likewise for any variation of this scenario in which f stands in a maximal chain of full grounding, which includes a fundamental fact.

26 The first scenario illustrates the claim made in footnote 12 above that the demand that each non-fundamental fact has its total ground condition satisfied is distinct from the demand that all chains of grounding must terminate.

in g and merely partially grounded in h_3, and together g and h_3 fully ground h_2. And so on, so the Hs form an infinite descending chain of grounding such that each of the Hs, h_δ, is itself merely partially grounded in g as well as in the subsequent H, $h_{\delta+1}$, such that g and $h_{\delta+1}$ together fully ground h_δ.

The facts in the third scenario together form a *partially pedestalled chain* (Dixon 2016, 454–455; see also Pearson 2022). Our arguments apply against this kind of grounding structure, as a foundationalist would want. Because g is a merely partial ground of f in this structure, g cannot by itself satisfy f's total ground condition. Further, each of the other facts in the structure itself requires grounds, and so we cannot locate facts adequate to satisfy a total ground condition for f at any one of these either. For example, h_2 satisfies a ground condition for h_1, and so h_1 alone cannot satisfy a total ground condition for f, and h_3 satisfies a ground condition for h_2, so h_1 and h_2 together cannot satisfy a total ground condition for f, and so on.

The points just noted also undermine our ability to locate facts adequate to satisfy f's total ground condition at any level in the structure. For example, if we consider the level made up of g and h_1, together these are sufficient for f to be grounded, but they cannot satisfy f's total ground condition since h_1 itself has further ground conditions: h_1 cannot obtain unless h_2 does, and so f cannot obtain unless h_2 does. And so on for the level made up of g and h_2 together, and the one made up of g and h_3 together, etc. Thus, COMPLEX arises in the third scenario, and so our argument stands against it.

5 Conclusion

We have suggested that the vicious regress argument for foundationalism can be understood in two ways: as containing a strong or a modest claim. The STRONG CLAIM will likely be something the anti-foundationalist denies. The MODEST CLAIM, together with PS, supports MODEST FOUNDATIONALISM for facts lying on single maximal grounding chains. MODEST FOUNDATIONALISM can also be shown to hold for at least some complex scenarios where facts belong to multiple maximal grounding chains. This position opens a new topic in the debate between foundationalism and anti-foundationalism; it places a burden on the anti-foundationalist to provide reasons to think that anti-foundationalism is metaphysically possible.*

* We have been working on this paper, or ancestors of it, for a very long time, so we apologise in advance if we omit any names that should be included here. Thanks to Sarah Adams, Einar

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Bohn, Anjan Chakravartty, Nikk Effingham, Matteo Morganti, Ciaran O'Conaill, Tuomas Tahko, Benjamin Schneider, Ralph Weir, Nathan Wildman, two referees for this journal, and various referees for other journals who read and commented on drafts. Thanks also to audiences in Bristol, Groningen, and Ligerz for their feedback. O'Conaill's work on this article was supported by the Kulttuurin ja Yhteiskunnan Tutkimuksen Toimikunta (grant number 274715) and the Schweizerischer Nationalfonds zur Förderung der Wissenschaftlichen Forschung (grant applications 189031 and 166320). Pearson's work on this project was supported by the John Templeton Foundation (grant number 40485-SG-0659).

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