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The Taming of the Grounds

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Abstract

As it is presently employed, grounding permits grounding many things from one ground. In this paper, I show why this is a mistake by pushing for a uniqueness principle on grounding. After arguing in favor of this principle, I say something about it and kinds of grounding, discuss a similar principle, and consider its import on a formal feature of grounding, ontology, and ontological simplicity.

As it is presently employed, grounding is untamed. What do I mean by this? I mean that too much is gotten from too little. We have something and from it we are, in principle, able to ground all sorts of things. An example of this involves sets. Assuming that sets are grounded in their members, it follows, via several standard principles of grounding, that for any x, x grounds the following singleton and non-singleton sets: $\{x\}$, $\{\{x\}\}$, $\{\{\{x\}\}\}$, …, sets of these singletons, sets of sets of these singletons, and so on.[1] But there are other cases. According to priority monism, the cosmos grounds all its proper parts. Or, if wholes are grounded in their parts, then if the lump and the statue exist and so have the same proper parts (at least at the microlevel), then each is grounded in these parts.[2] And according to certain ways of thinking about substrata and modes, each is grounded in the appropriate thick particular (Schaffer 2009, 379).[3]

Now, to me, this bounty of things from one ground is not only surprising but unwelcome. The aim of the first part of this paper is to make you see this and in so seeing, convince you that we need a tamer approach to grounding. The aim of the second part is to show you that once this approach is accepted, many interesting things follow. But first, some preliminary remarks are in order.

The assumptions I make about grounding are nontrivial. So I am pursuing a non-neutral account of grounding. Some might not like this. But other than preventing some from accepting the central conclusions of this paper, I am not sure why. After all, pursuing a non-neutral account has the virtue of showing what someone may be committed to if they adopt this account. That is, what I do with these assumptions will be a comment on them. If what results from them is good (as I believe is the

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[1]The transitivity of grounding gets us all but the first singleton and the well-known Cut in conjunction with a plausible principle of absorption for plural terms ($x, x = x$) gets us the rest.

[2]I say "at least at the microlevel" for those who think that the statue has parts at the macrolevel that the lump does not (Michelangelo's *David*, for example, has a marble hand as a part that perhaps the lump of marble does not).

[3]Aristotle seems to accept something like this. In speaking of the *Categories*, Gill (1989, 3) says "The primary substances of the *Categories*, such as particular men and horses, are subjects that ground the existence of other things; some of the nonprimary things, such as qualities and quantities, exist because they modify the primary substances … Therefore the existence of other things depends upon the existence of these basic entities."

case), then we have reason to prefer them and progress will have been made. If what results from them is bad, then we have reason to reject them and can scale back. And this, of course, is just part of the project of deciding between various philosophical and scientific packages. Far from being a bad thing, this is exactly what we should be doing.[4]

This paper works with two notions of grounding (here and throughout the paper, grounding is *full grounding*). One is the notion of some thing or things *depending* on something else. If you want, call it 'grounding as dependence.' This is a category neutral notion: any kind of thing, whether fact, individual, or property, is apt to be grounded. This follows from the fact that dependence is a category neutral notion: facts, individuals, and properties can all depend on other things. This notion should be contrasted with a notion of grounding according to which some thing or things *explain* something else. If you want, call it 'grounding as explanation.' This is not a category neutral notion. It is only proposition-like things, such as propositions, facts, or states of affairs that can explain and be explained (or, if we decide to express this notion with the sentential operator 'because,' it is sentences or pluralities thereof, as opposed to names, that will flank this operator). Now, it is important to see that when it comes to this latter notion, what matters is not the existence and nature of the proposition, fact, or state of affair being explained but the existence and nature of the constituents of that proposition, fact, or state of affair (henceforth, 'fact'). Put differently, what matters is what the fact is "about," its "content," or "subject matter." Suppose that the fact that the hole is large is explained by the fact that the perforation is large. Here, what matters is not the existence and nature of the fact being explained but the existence and nature of a constituent of that fact: the hole. And the way this fact is explained appeals to a fact about the hole's ground: the perforation. Facts about the perforation explain facts about the hole.

Because we have these different notions, it will help to adopt labels specifying when one or the other of these notions is in mind. From here on out then, when I talk in terms of grounding, I have in mind grounding as dependence and when I talk in terms of explanation, in virtue of, or because, I have in mind grounding as explanation.[5]

Two unargued for assumptions: first, facts inherit their explanatory status—explained or not explained—from the grounding status of the things that are their constituents. So if a fact is explanatorily fundamental, that's because each of its constituents is ungrounded and so fundamental.[6] In this sense, grounding (as dependence) comes first. And because it does (or so I am

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[4]For more on grounding and concerns about non-neutrality, see this paper's conclusion.

[5]Which side does this put me in when it comes to the *separatist* versus *unionist* debate in grounding (Raven 2015, 326)? On the one hand, I reserve the word 'grounding' not for explanation, but for a kind of dependence (grounding as dependence) and 'explanation' not for dependence, but for a kind of explanation (grounding as explanation). This seems to put me in the separatist camp. On the other hand, nothing I say makes explanation a matter of the explanatory goals and interests of agents such as ourselves. Indeed, I take the kind of explanation I am concerned with to be a thoroughly worldly affair. This seems to put me more in the unionist camp. Now, assume that hole H is large because perforation P is large. Some separatists will say that what "backs" or "undergirds" this is that H's being large is non-causally generated, produced, or dependent on P's being large (for more on what this "backing" relation amounts to, see Kovac [2020a]). But I do not say this. What, if anything, H's being large is grounded in, and so dependent on, are its constituents: H, being large. Now, if separatists want to insist that H's being large is non-causally dependent on P's being large given some notion of non-causal dependence, fine. But keep in mind that what matters in this non-causal dependence claim is what the facts flanking the dependence relation are "about." What matters is their "content" or "subject matter." That is, this dependence claim is more like what I am calling 'explanation.' Whether we "connect" H's being large and P's being large by appealing to dependence (the former fact depends on the latter) or explanation (the former fact is explained by the latter), what matters here is that facts *about* the hole depend on or are explained by facts *about* the perforation. Because of this, the distinction I make between grounding and explanation is not the distinction certain separatists or unionists make between grounding and explanation (it is not the distinction unionists make since, being unionists, they do not distinguish between grounding and explanation). Indeed, the way I have framed things has it that there is a way of distinguishing between grounding and explanation that is either not captured in the debate between separatists and unionists or, if it is captured by this debate, amounts to a certain way of distinguishing between separatists and unionists.

[6]This assumption is very similar to Sider's (2011, 128) account of fundamentality. Talking in terms of propositions rather than facts, he says "The ultimate locus of fundamentality for me is subpropositional. (I have no objection to propositional

assuming), focus will be placed on it. But this does not mean that considerations involving explanation will not be important. As it turns out, principles involving how explanation relates to grounding will be appealed to in order to drive home conclusions about the latter. And so, showing how they relate will, at times, take center stage. Still, the focus is on grounding.

Second, I assume that if a thing is grounded, then it exists and is the way it is because whatever grounds it exists and is the way it is.[7] Linking grounding with explanation in this way is not new. Schaffer (2010a, 345) gets close to doing it when he says "[Grounding is] the metaphysical notion on which one entity depends on another for its nature and existence." deRosset (2013a, 4) affirms it, saying "the entities that ground *e* are supposed to be the entities in virtue of which *e* exists and has the nature it does." Cameron (2014, 97) says something similar when he says that "the derivative object has its properties *in virtue of* the features of its grounds." And Wilson (2012, 15) suggests it when she takes determinates grounding determinables to entail that "all facts about (instances of) determinable properties are to be fixed by facts about (instances of) determinate properties."[8]

When it comes to formulating principles of grounding, '<' will express full grounding and will take either the following many-one form 'Γ < *x*,' where 'Γ' denotes a plurality that grounds *x*, or the following one-one form '*x* < *y*.' Similarly, when it comes to principles involving explanation, 'because' will express full explanation and will take the form '*Fx* because *GΓ*,' with single sentences flanking the sentential operator (there will be no need to consider cases where 'because' is flanked by a plurality of sentences on its right-hand side). Finally, all principles are taken to be, if true, necessarily true.

1. The principle

1.a Property fixing

Consider the grounding problem between material coincidents.[9] We have a statue, 'Statue,' constituted by a lump of clay, 'Lump.' Statue is not Lump since the former, but not the latter, is a statue and cannot survive being smashed. But how can Statue and Lump differ given that they have the same parts (at least at the microlevel) arranged in precisely the same way? Put differently, Statue is a statue because of facts involving its grounds (its microstructure). But Lump, it seems, has the

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notions of fundamentality—such as various notions of fundamental truth—so long as they are defined in terms of the subpropositional notion of structure)." For those who go in the other direction, and so take things to inherit their grounding status—grounded or ungrounded—from the explanatory status of facts involving such things, see Rosen (2010, 112) and deRosset (2010, 75; 2013a, 4) (and perhaps Schnieder [2006, 412], though he uses the terms 'substance,' 'rigid dependence,' and 'permanent dependence').

[7]But perhaps *x* is some way because it is some other way? Still, given that *x* is grounded, the assumption here has it that we will reach a point where facts that have *x* as a constituent will eventually give way to facts that have as a constituent some ground or other of *x*.

[8]Wilson famously denies the existence of "Big-G" grounding relations in a later work (Wilson 2014). But in the paper cited in the main text, she takes grounding to be "a relation of *complete asymmetric ontological dependence*." Going on, she says that

> reflecting the 'All God had to do,' 'fixing,' 'in virtue of,' and 'nothing over and above' locutions, the dependence associated with metaphysical ground is complete: if an entity is metaphysically grounded in some other entity or entities then, in the first instance, the latter serve as a complete basis for the existence and features of the former … While leaving open certain further details, a characterization of grounding as involving complete asymmetric ontological dependence, as informed by the intuitive locutions, is, I believe, sufficiently specific to fix ideas and to avoid any untoward equivocation in what follows. (2012, 3)

Here then, for her purposes, it looks like Wilson is content to appeal to a rather Big-G notion of grounding.

[9]See, *inter alia*, Burke (1992), Zimmerman (1995, sec. 9), Baker (1997, sec. 2), Rea (1997, sec. 4), McDaniel (2001), Paul (2002, sec. 5), Wasserman (2002) Bennett (2004), Fine (2008), Koslicki (2008, 179–83), Sider (2008a), deRosset (2011), Crane (2012, sec. 5), Sutton (2012), Korman (2015, sec. 11.3), Saenz (2015), and Moran (2018).

same grounds (same microstructure). So these facts also hold of Lump's grounds. Thus, what explains that Statue is a statue is also true of Lump. Yet somehow, Lump is not a statue.

I appealed to materially coincident things. But I need not have. Suppose, as some have (Schaffer 2010b), that the proper parts of the cosmos are grounded in the cosmos. Take me and the computer I am typing on. I am not this computer since I, unlike the computer, am a person and can think. But how can we differ given that we have the same metaphysical base? Put differently, given that the parts of the cosmos are grounded in the cosmos, I am a person because of facts involving the cosmos. But the computer has the same ground (it is part of the same cosmos). So these facts also hold of its ground. Thus, what explains that I am a person is also true of the computer. Yet somehow, the computer is not a person.

Here is another case. Many think that sums are grounded in their parts and sets in their members. So we have Quine, Carnap, their sum ('Sum'), and their set ('Set'). Now Sum is not Set since the former, but not the latter, is concrete and weighs n pounds. But how can Sum and Set differ given that they have the same metaphysical base? Put differently, given that sums are grounded in their parts and sets in their members, Sum is concrete because of facts involving its grounds (Quine, Carnap). But Set has the same grounds (Quine, Carnap are its members). So these facts also hold of Set's grounds. Thus, what explains that Sum is concrete is also true of Set. Yet somehow, Set is not concrete.

The structure of these puzzles is the same. So the puzzle is not at all unique to the cases I have used in order to illustrate it. To see this more clearly, notice a principle undergirding these cases: that if grounded thing x is F because of some fact or facts involving its grounds, then for anything y with the same grounds, y is F. That is, if x is F because its grounds Γ are collectively some way G, then for any y, if what grounds y are Γ, y is F. More formally,

Fix. $\forall x \forall \Gamma ((\Gamma < x \ \& \ Fx \text{ because } G\Gamma) \rightarrow \forall y (\Gamma < y \rightarrow Fy)).$[10]

Using Fix to express the first of the above cases, Statue is a Statue because of facts involving its grounds. But these facts appear to hold of Lump's grounds (same microstructure). And so from Fix, Lump is a statue. But Lump is not a statue. Hence, the grounding problem between materially coincident entities.[11]

Focusing on the grounding problem between materially coincident entities, note the lengths many have gone in trying to solve it. Appeal has been made to a four-dimensional view of persisting objects (Sider 2001, sec. 5.8; Wasserman 2002), material objects having non-material parts (McDaniel 2001; Paul 2002; Fine 2008; Koslicki 2008), to sortal and/or modal properties of coincident entities being brute (Bennett 2004; Moran 2018), to a plenitudinous ontology (Bennett 2004, sec. 4), and to fictionalism about monadic modal properties (Sider 2008a). That the grounding problem has led many to take seriously such solutions, all of which seem to preserve

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[10]Where the quantifiers range over possible objects, Rosen (2015, 198–99) discusses the following related principle (see also Moran [2022, 413] for a nearly identical principle dubbed 'Generality'):

Weak Formality. $\forall x (Fx \text{ because } Gx \rightarrow \forall y (Gy \rightarrow (Fy \text{ because } Gy))).$

That is, where x is a possible object, if x is F because it is G, then for any possible y, if y is G, then y is F because it is G. There are several differences between Weak Formality and Fix. But as I see it, the main difference is that Weak Formality states a necessary condition on cases where something is some way because *that very thing* is some other way. Fix, however, states a necessary condition on cases where something is some way because *its grounds* are some way.

[11]The grounding problem between materially coincident entities is sometimes (though not always) cast as what could make it the case that categorically indiscernible things differ in their noncategorical properties, where categorical properties are responsible for non-categorical properties? But this is just an instance of 'what could make it the case that F-indiscernible things differ in their non-F properties, where F properties are responsible for non-F properties?' And this is what we have here and in the other cases: how can things that are indiscernible with respect to their grounds differ in those ways that do not appeal to those grounds? There is nothing special or unique here about categorical and non-categorical properties.

Fix (or some supervenience-style version of it), shows just how reluctant many are to reject this property fixing principle.[12]

This reluctance is well-motivated. Without Fix, it may be that something is F in virtue of facts involving its grounds while something else, in spite of having the same grounds, is not. But this is hard to stomach. In talking about the grounding problem between persons and animals, Olson (2001, 345) says

> What the critics want to know is *why* Person can think. They doubt whether any satisfactory answer is compatible with the claim that Animal, which has the same microstructure, the same surroundings and the same evolutionary history as Person, cannot think. Likewise, they want to know why Animal is an animal, and they doubt whether any satisfactory answer is compatible with the claim that Person, despite being made entirely of living tissues arranged just as Animal's are, is not an animal.

Notice what the problem is. Why can Person, but not Animal, think given that whatever it is that is able to explain that Person can think—its microstructure, surroundings, and evolutionary history—is true of Animal? Since there is nothing unique here about Person and Animal, what Olson says is just as forceful when applied more generally by asking 'why is x, but not y, F given that whatever it is that is able to explain that x is F is true of y?'[13]

I have, here, focused on the grounding problem in order to motivate Fix. But, as my appeal to cases not involving materially coincident entities shows, we can motivate it independently (as I have already remarked and as these other cases show, the problem here is not at all unique to materially coincident things). Given our assumption that if something is grounded, then it exists and has the nature it does because its ground exists and has the nature it does, Fix becomes very plausible. Suppose that x is F because its grounds, Γ, are G. Suppose also that y is grounded in Γ. Now it would be a very strange thing if y were not also F. Why the difference, given that x and y are grounded in the same thing and that if something is grounded, then it exists and has the nature it does because its ground exists and has the nature it does? Here, for some weird and seemingly inexplicable reason, that the ground of x and y is some way results in x's, but not y's, being F. This is hard to believe.[14]

1.b Similar principles

Before moving on, it is worth contrasting Fix with two other principles.[15] The first is given by deRosset (2010, 2013b). Following his notation, where 'r' names a raindrop, suppose that

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[12]For less revisionary solutions to the grounding problem, all of which also seem to preserve Fix (or some supervenience-style version of it), see Rea (1997, sec. 4), deRosset (2011), Crane (2012), Sutton (2012), Korman (2015, sec. 11.3), Saenz (2015), and Moran (2022).

[13]Notice that the grounding problem does not obviously arise for things that do not have the same grounds (in the person and animal case, same microstructure, surroundings, and evolutionary history). There is no grounding problem between me and the computer I am writing on. I am a person because of various facts about my microstructure Γ: that Γ are G. Now my computer is such that Γ are G. But there is no temptation to say that because of this, my computer is a person. My computer does not inherit its properties from my grounds but from *its* grounds.

[14]In addition to Fix, I favor accepting something stronger (where 'Δ' is a plural variable):

Strong Fix. $\forall x \forall \Gamma ((\Gamma < x \ \& \ Fx \text{ because } G\Gamma) \rightarrow \forall \Delta \forall y ((\Delta < y \ \& \ G\Delta) \rightarrow Fy)).$

That is, if x is F because its grounds are collectively G, then for any grounds of y, if they are collectively G, y is F. But because Strong Fix is more than I need, I do not discuss it here.

[15]The principles I am about to discuss resemble Fix in certain important ways. I have already mentioned, in 10, another principle that is somewhat like Fix (Rosen 2015, 198–99; Moran 2022, 413). There are also principles that, though rather different from Fix, are like it in that the "innards" or "content" of the facts matter; like Fix, they are principles that are sensitive to what goes on "inside" the facts doing the explaining or being explained. See Rosen (2010, 131), Audi (2012, 108–10), Fine (2012, 75), and Saenz (2018, 103; Forthcoming, sec. 1).

1. r is F because $\phi(r, t_1, \ldots, t_n)$

where "all of the individuals involved in the *explanans* are denoted by exactly one term among r, t_1, $\ldots$, t_n, and ϕ says how the properties and relations in question are distributed over those individuals" (2010, 79).[16] Now the constraint that deRosset puts on explanation says that good explanations do not have confounding cases. What is a confounding case? A confounding case of 1 is a case in which something $r^\star$, along with some other things, have the properties needed to "satisfy the *explanans* clause ϕ, but in which $r^\star$ lacks F" (80). That is, $r^\star$, along with the other things, instance

$$\exists y_1, \ldots, y_n \exists x \big(\phi(x, y_1, \ldots, y_n) \,\&\sim Fx\big).$$

So if 1 is a good explanation, then according to deRosset's constraint on explanation, the above existential statement is false. That is

$$r \text{ is F because } \phi(r, t_1, \ldots, t_n) \rightarrow \forall y_1, \ldots, y_n \forall x \big(\phi(x, y_1, \ldots, y_n) \rightarrow Fx\big).$$

Generalizing, we get

Determination.
$$\forall y_1, \ldots, y_n \forall x \big(x \text{ is F because } \phi(x, y_1, \ldots, y_n)\big) \rightarrow \forall y_1, \ldots, y_n \forall x \big(\phi(x, y_1, \ldots, y_n) \rightarrow Fx\big).$$

Now, Fix and Determination vary in important ways. First, Determination does not require, in the antecedent, that the things that satisfy the *explanans* clause ϕ ground the thing that is F. But Fix does, stating a necessary condition on cases where something is some way because this thing's *grounds* are some way. Second, Determination has it that for anything whatsoever, if it, along with other things, satisfy the *explanans* clause ϕ, then it is F. This is not so for Fix. Instead, it has it that for anything whatsoever, if it is grounded in the things that ground x, then it is F.

These differences matter. deRosset uses Determination to argue against

Explanation. The existence and features of the macroscopic concrete objects … can be completely explained solely by reference to the existence and properties of other things

(Explanation is very much in the spirit of one of the assumptions of this paper: that if something is grounded, then it exists and is the way it is because whatever grounds it exists and is the way it is). Here is the argument. Suppose that we have a raindrop r, tectonic plate t, where r, but not t, is transparent. Also suppose, consistent with Explanation, that

2. r is transparent because $R(u_1, \ldots, u_n)$,

where 'R' stands for some complex relation and none of the terms 'u_1,' … 'u_n' denote r. That is, we have a claim of the form 'r is transparent because ϕ,' where "ϕ says how certain properties and relations are distributed over individuals other than r" (2010, 82).[17] Now given Determination, it follows that 2 is true only if the following universal generalization is true

$$\forall y_1, \ldots, y_n \forall x \big(R(y_1, \ldots, y_n) \rightarrow x \text{ is transparent}\big).$$

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[16] As deRosset makes explicit (2010, 79), he does not assume that any formula of the form $\phi(r, t_1, \ldots, t_n)$ contains r or any of the ts. As we will soon see, this is important.

[17] So '$R(u_1, \ldots, u_n)$' is of the form '$\phi(r, u_1, \ldots, u_n)$' since, as stated in 16, deRosset does not assume that any formula of the form $\phi(r, x_1, \ldots, x_n)$ contains r.

But given that '$R(y_1, …, y_n)$' does not contain 'x,' this is equivalent to

3. $\exists y_1, …, y_n \big(R(y_1, …, y_n) \big) \to \forall x (x \text{ is transparent})$.

Assuming then that 2 is a good explanation, $R(u_1, …, u_n)$ is true. So the antecedent of 3 is satisfied, from which it follows that everything, and so t, is transparent! But t is not transparent. So 2, which is the proposed explanation, fails. Given Determination, Explanation is false.[18]

Fix, however, does not tell against Explanation (which I take to be a good thing). In order to infer from Fix that t is transparent, it must be that t is grounded in whatever grounds r. But it is not. Plausibly, what grounds r (its microstructure) does not ground t (r's microstructure is not t's). From Fix then, it does not follow that t is transparent. And so 2 does not fail and Fix does not threaten Explanation.

We have seen why this difference exists: in order to infer that t is transparent, Fix, unlike Determination, requires that grounding links exist between r, t, and $u_1, …, u_n$ (it requires that $u_1, …, u_n$ ground both r and t). Indeed, once we see the argument against Explanation from Determination, it is not hard to see what is needed in order to avoid having it that t is transparent: we need to add some condition or other that tells us how $u_1, …, u_n$ relate to r and to t (Saenz 2020, n30). And having it that $u_1, …, u_n$ ground r, but not t, is such a condition (recall footnote 13).[19] So Fix can be seen as supplying what is missing in the present case. But then Fix can be seen as supplying what Determination, here at least, omits.[20]

Here is another principle that Fix should be contrasted with. Where 'F' and 'G' are predicates that correspond to qualitative properties (the latter corresponding to the conjunction of all of y's qualitive properties), Barker (2021) has put forward the following thesis:

Property Fixing Thesis. $\forall x \forall y \big((Fx \ \& \ y < x \ \& \ Gy) \to \Box \forall z ((y < z \ \& \ Gz) \to Fz) \big)$.

That is, if x is F, y grounds x, and y is G, then necessarily, for any z, if y grounds z and y is G, then z is F.

There are several differences between Fix and Property Fixing Thesis ('PFT' for short).[21] First, there is a sense in which PFT is *stronger* than Fix. Notice that we are not told what *explanatory* role y's being G plays with respect to how x is. PFT does not, for example, say or require that x is F because y is G. It is consistent with PFT that y's being G does not explain x's being F. So unlike Fix, PFT is not a constraint governing *explanation*. In this sense, PFT is stronger than Fix. The latter requires that x is F because y is G in its antecedent. PFT does not require this in its antecedent.

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[18]For responses to this argument, see von Solodkoff (2012) and Fisher, Hong, and Perrine (2021).

[19]deRosset (2010, 83) gets close to noticing this. But he construes it as suggesting that $u_1, …, u_n$ grounding r (or as he puts it, composing r) should be *part of what explains* that r is transparent. Fix, of course, does not say this. Nor does it need to. In order to avoid having it that t is transparent, it is enough to say that $R(u_1, …, u_n)$ explains that r is transparent, that $u_1, …, u_n$ ground r, and that $u_1, …, u_n$ do not ground t. We do not need to include the claim that $u_1, …, u_n$ grounding r is part of what explains that r is transparent. (See von Solodkoff [2012, 397] who, in response to deRosset, distinguishes between what is *responsible* for the truth of some claim and what is *required of reality* in order for that claim to be true.)

[20]A referee wonders if having it that $u_1, …, u_n$ ground r prevents Determination from being sufficiently general. For example, there are explanations of the form 'Fx because Gx' (same variable), but we would not require that x grounds x on pain of violating a formal constraint on grounding (that grounding is irreflexive). But shouldn't Determination say something about such cases? Is not Determination supposed to tell us when an explanation *whatsoever* is a good one? Well, part of the point of the present discussion is that Determination is ill-suited to tell us when an explanation, whatsoever, is a good one. It is one thing for something to be some way because *it* is some other way. It is another thing for something to be some way because its *grounds* are some way. But Determination overlooks this. It is not sensitive, or sensitive enough, to this distinction. To repeat, once we see the above argument against Explanation from Determination, it is not hard to see what is missing in the case considered: we need to add a condition that tells us how $u_1, …, u_n$ relate to r (and to t). But of course, no such condition is needed in cases where we explain that r is some way by appealing to r being some other way. And this suggests, at least with respect to the kind of constraint Determination is putting on explanation, the need for principles that respect this difference.

[21]Upon finishing an early draft of this paper, Barker and I came across each other's papers (his paper was, at the time, still unpublished). As I detail in the main text, there are differences between his principle and mine having to do with what these principles say, how they are (or are not) motivated, and what work they can do.

Second, there is a sense in which PFT is *weaker* than Fix. PFT restricts itself to qualitative properties. Because it does, it allows things that share a ground to be numerically, even if not qualitatively, distinct. But Fix does not restrict itself in this way. It holds for qualitative and non-qualitative properties alike. Because of this, as will soon be made clear, Fix does not allow things that share a ground to be numerically distinct. In this sense, PFT is weaker than Fix.[22]

Third, Barker and I view our respective principles differently. I have argued in favor of Fix. Barker does not argue in favor of PFT (indeed, he has communicated to me that he rejects it). He does argue that it follows from the following purity thesis: there are no fundamental facts about grounded things. But it is no part of Barker's paper to accept this purity thesis (in fact, Barker seems more than open to rejecting it and, in his paper [Barker, Forthcoming] does reject it). Barker and I also put our principles to some different uses. To give just one example, Barker appeals to PFT in order to argue *against* the claim that grounded things are ontologically innocent with respect to their grounds. I, however, appeal to Fix in order to argue in favor of a stricture on grounding which, in turn, allows me to *defend* the claim that grounded things are ontologically innocent with respect to their grounds (see sec. 3.2).

1.c The argument

I will now show that Fix, along with some plausible assumptions, gives rise to a powerful stricture on grounding.

Making use of the third case discussed earlier, suppose for *reductio* that Quine, Carnap collectively ground their sum and their set. Now this sum weighs n pounds because its summands, Quine and Carnap, weigh n pounds. Given Fix, it follows from Quine, Carnap collectively grounding their set that this set weighs n pounds. But it does not. Sets, unlike sums, are not the kinds of things that have weight and so are not the kinds of things that weigh n pounds. And so, since Fix should not be rejected, we must reject that Quine, Carnap collectively ground their sum and their set.

To appeal to a case involving qualitatively identical things, and so to a case where things involved are as similar as can be (short of being one and the same thing), suppose for *reductio* that we have a Max Black world with two spheres, A and B, each of which are grounded in the same pure properties the Fs (some form of bundle theory holds here). Now A occupies region R because the Fs occupy R. Given Fix, it follows that B occupies R. But it does not, instead occupying R*. Since Fix should not be rejected, we must reject that the same pure properties can ground numerically distinct individuals.

Finally, to use our first case, suppose for *reductio* that what grounds Statue grounds Lump (their microstructure). Now Statue is a statue because of facts involving its ground. Given Fix, it follows that Lump is a statue. But it is not. Since Fix should not be rejected, we must reject that Statue and Lump have the same grounds.

Generalizing, where 'α,' '*a*,' and '*b*' are constants (with 'α' being a plural constant) and *a* is not *b*, here is the argument:

1. $\alpha < a$ & $\alpha < b$ (for *reductio*)
2. F*a* & ~F*b* (assume)
3. F*a* because Gα (assume)
4. F*b* (1, 3, Fix)

Since 4 and 2 are inconsistent, we must reject 1: α can ground at most one thing. Now since no special assumptions were made about α, *a*, and *b*, the reasoning generalizes: everything can ground at most one thing. And so we have a uniqueness principle for grounding, namely

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[22]Barker also has a necessity operator governing the consequent of the main conditional. But it is not clear what work this operator is doing. Indeed, without it, there would be no need to include, in the antecedent of the conditional governed by the necessity operator, the claim that *y* is G (since that *y* is G is being assumed in the antecedent of the entire conditional). As far as I can tell then, the following principle would have done for Barker's purposes: $\forall x \forall y((Fx \ \& \ y<x \ \& \ Gy) \rightarrow \forall z(y<z \rightarrow Fz))$.

Grounding Uniqueness. $\forall x \forall y \forall \Gamma ((\Gamma < x \,\&\, \Gamma < y) \rightarrow x = y)$

('Uniqueness' for short). Plainly put, if x and y share a ground, then x is y.[23] This is the argument from Fix to a stricture on grounding. The argument involves three basic premises. Since the first is our assumption for *reductio*, we are left with 2 and 3.

Starting with 2, that a is some way that b is not is hard to deny. For one, there will always be a difference in identity: a, but not b, is identical to a. But pushing this to the side, notice that there are no plausible cases involving two or more things failing to differ. The most plausible concern qualitatively identical things. But even here, there are non-qualitative differences. Take again A and B. In a Max Black world, A, but not B, occupies R, can survive the destruction of B, and is closer to A than to B.

Moving to 3, the notion of ground at work in this paper has it that grounded things are the way they are because their grounds are the way they are. So this notion guarantees 3: that a is F because its grounds α are some way. Suppose though that we reject 3 and so deny that a is F because of how its grounds are (notice that this is consistent with Fix). Then the difference between a and b—that a is F and b is not—must be *brute*, and so not had on the basis of facts involving their grounds.[24] And so, if we deny 3 but affirm Fix, then if a and b share a ground, then either they are identical or, if they are not identical, differences between them are brute. Though this condition is not quite as strong as what we get in Uniqueness, it is still weighty. And so the reasoning that otherwise leads to Uniqueness still packs quite a punch!

Uniqueness has a precursor. Nelson Goodman (1956) famously pushed for the following nominalist dictum: no difference of entities without a distinction of content. Or in another work (1958), no two entities are generated from exactly the same atoms. Or as it is most often put, no difference without a difference maker (Varzi 2008).[25] For Goodman, a generating relation is the proper-part relation, the ancestral of set-membership, or their disjunction and an atom is something that is not generated. So where 'x' and 'y' range over generated objects, 'z' ranges over atoms, and 'G' expresses the generating relation, we have

Dictum. $\forall x \forall y \forall z ((Gzx \leftrightarrow Gzy) \rightarrow x = y)$.

Dictum notoriously eliminates sets.[26] But it does not eliminate mereological wholes. It instead puts a restriction on them: no two wholes can have the same atoms as parts. This is, minus the restriction to atoms, the uniqueness of parthood (for an explicit rendering of this uniqueness principle and discussion of it, see sec. 2.b).

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[23]Bolzano (1837, sec. 206) accepts something like Uniqueness, though his reasons for doing so are different from mine (Tatzel 2002, 13). And Bennett (2017, 25–26) affirms the spirit of it when she says "it is at least somewhat odd to think that the same input, plugged into the same nondisjunctive [building] relation, can generate very different outputs. Oughtn't there be something else that makes the difference?"

[24]A referee suggests that the difference may not be brute. For it may be based on facts that do not involve the grounds of a and b. But this is a strong suggestion. It is not just that certain facts about a, say, are not had on the basis of a's grounds (which would be true were these facts about a brute). It is rather that certain facts about a are explained by facts that do not involve a's ground *at all* (for if they did involve their grounds, then these facts about a would be explained by facts involving their grounds). And this is hard for me to accept. Put differently, if there are facts about a that are explained by facts that do not involve α, then we have reason to think that a is not grounded in α.

[25]This last way of expressing Goodman's nominalism is poorly phrased (thanks to Selim Berker for pointing this out). The idea behind it is not so much, as it seems to suggest, that facts of the form 'x is distinct from y' are generated or need a maker. It is instead saying, in accordance with Goodman's nominalism, that different things cannot have the same maker. So let me suggest an alternative expression in suggesting that "no difference without different makers" does better.

[26]This is only because the generating relation is defined in terms of the ancestral of set-membership. Had it been defined instead in terms of set-membership only, Dictum would have only yielded something everybody accepts: that no two sets can have the same atoms as members.

What should we think of Goodman's definition of 'generate'? If he is merely stipulating what he means by it, then as Lewis (1991, 40) says, I can hardly object. But if Goodman was trying to capture a sufficiently general pre-theoretic notion of 'generate,' then I do object. Some things generate other things even though the former are neither proper parts nor ancestors of members of the latter. This seems especially true when it comes to properties. Perhaps physical properties generate non-physical properties, natural properties normative properties, chemical properties biological properties, and so on. Indeed, in describing his generating relation, Goodman uses words and phrases that would appear to be consistent with this list of things generating things. He talks of things being made up of other things and things that concoct and result in something else.

What should we think of Dictum? Granting Goodman his definition of 'generate,' it is objectionable since two or more wholes (Statue and Lump) can share all their proper parts and two more or more sets (my singleton and its singleton) can have the same atoms (me).[27] Still, Dictum is on to something. The spirit of it, captured by the slogan "no difference without different makers," seems true. How, though, can we make sense of this slogan once we reject Dictum? Here, I suggest appealing to Uniqueness. That is, it is grounding that this slogan holds true of and so Uniqueness that best captures it.

It is helpful to have a picture of the grounding patterns Uniqueness both does and does not allow. Where the arrow represents the grounding relation, if Uniqueness is true, then the left and middle diagrams are possibly instanced. The right is not.[28]

b b b_1 b_2

a_1 a_2 a a

Possible   *Possible*   *Impossible*
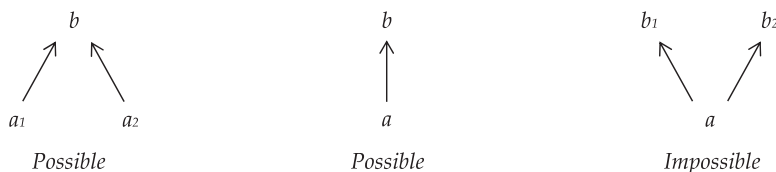
In ruling out the getting of many from one, Uniqueness makes grounding *branches* impossible. But it is consistent with grounding *roots* in that it permits the getting of one from (read distributively) many.

1.d Kinds of grounding

Some will protest. Assuming that there are logically complex properties, does not the property of being F ground the property of being F∨G, the property of being F&F, and the property of being ~~F? And if so, is not Uniqueness false?[29]

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[27]How, though, should we best understand these claims about wholes and sets in light of Uniqueness? See sec. 2.b for the answer.

[28]In diagrams of grounding, it is assumed that grounding holds one-one. Also, such diagrams are merely suggestive: no study of the types of models had by a theory of grounding will occur in this paper.

[29]I have referred to such properties with operators that typically combine with sentences to make sentences (the usual sentential connectives in logic). Here though, the operators are combining with predicates. We can, I think, make good sense of this. But if we want to avoid it, we can (as suggested by a referee) appeal to the lambda operator as a property forming operator (Fine 2012, sec. 1.9). So we can take the 'the property of being F∨G' to refer to $\Lambda x.Fx \lor Gx$, which is the property of being an x such that $Fx \lor Gx$, where '$\Lambda x.Fx \lor Gx$' is a singular term and not a predicate. Given this, the claim will then be that the property of being F grounds $\Lambda x.Fx \lor Gx$, $\Lambda x.Fx \& Fx$, and $\Lambda x.\sim(\sim Fx)$. And if so, then Uniqueness is false.

One way of responding to this worry is to go rogue by rejecting that the property of being F grounds these logically complex properties.[30] This is, in fact, my preferred response. But here, I want to give a less drastic response by granting that there is grounding going on in these cases, but that the kind of grounding involved is different than the one involved in Uniqueness. This is not ad hoc since this way of responding is independently motivated. Recall one of the assumptions made in this paper: that grounded things are the way they are because their grounds are the way they are. But this assumption does not generally hold when logically complex properties are grounded in the above kind of manner. There is little temptation to say that, in general, the property of being F∨G is the way it is because the property of being F is the way it is (for example, there is nothing about the property of being F that explains that the property of being F∨G is logically complex, has two disjuncts, or is instantiated if the property of being G is). This is also why there is no analogous grounding problem when it comes to grounding these logically complex properties in this way. The property of being F∨G and the property of being ~~F are sortally and modally different (the former, but not the latter, is a disjunctive property and can be instantiated even if the property of being F is not). But in spite of both being grounded in the property of being F, there is no grounding problem. Why? Because we are not at all inclined to think that the property of being F∨G and the property of being ~~F must get their character from the property of being F (and so on more generally for other logically complex properties).[31]

We started this paper with some reasonable, albeit non-neutral, assumptions about grounding. Given them, we are now able to motivate thinking that there are in fact two kinds of grounding: one that obeys these assumptions and so obeys Uniqueness and one that does not and so does not. We are familiar with the first kind: it is the kind found in cases where something metaphysically depends on some thing or things for its existence and nature.[32] We are also familiar with the latter kind: it is the kind found in cases where the logically atomic gives rise to the logically complex. This distinction is important. Going in for such a non-univocal conception of grounding might strike some as a cost. But it is a cost we must put up with. Unless we reject that some things metaphysically depend on other things for their existence and nature, it looks like we must accept that there is some joint or other in grounding. There is, on the face of it, a natural difference between grounding as

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[30]For some who reject cases of grounding like this, see Trogdon (2018, sec. 3.3), Kovacs (2020b, sec. 4.4), and McSweeney (2020).

[31]A referee suggests a different response. It is not that the property of being F grounds these logically complex properties. It is rather that something has the property of, say, being F∨G because it has the property of being F. Here then, we deny that the property of being F∨G is grounded in the property of being F and instead say that facts involving something being F∨G are *explained* by facts involving something being F. This blunts the force of the putative counterexample since Uniqueness holds for grounding but not explanation. What is more, it does not require that we posit two different kinds of grounding but only that we distinguish between grounding and explanation (something I have already done). Be this as it may, responding in this way is not something I want to do. It seems to me that if something is F∨G (some derivative way) because it is F (some more fundamental way), then the property of being F∨G is grounded in the property of being F. And so, we have not avoided saying that the property of being F∨G is grounded in the property of being F. Still, some might not like this link between explanation and grounding. If you do not, then the response suggested by the referee might be the response for you.

[32]This answers a question which has been put to me: which cases of grounding does Uniqueness cover? The answer: those cases where a thing (individual, property, or fact) depends on some thing or things for its existence and nature. And so, *and this is important*, I am not claiming that, for example, the property of being F∨G is not grounded in this way. That is, I am not claiming that the property of being F∨G falls outside the scope of Uniqueness (it does not). I *am* claiming that the kind of grounding going on in claims like 'the property of being F∨G is grounded in the property of being F' is not the kind of grounding found in cases where something metaphysically depends on some thing or things for its existence and nature. What then does the property of being F∨G metaphysically depend on? That is, what is the property of being F∨G grounded in, where the kind of grounding involved is the kind appealed to in Uniqueness? Here is a suggestion (and only a suggestion). Suppose that the property of being F* grounds the property of being F and that the property of being G* grounds the property of being G. Then it is natural to claim that the property of being F*∨G* grounds the property of being F∨G. Suppose also that the property of being F* and the property of being G* are fundamental properties. Then it is likewise natural to claim that the property of being F*∨G* is fundamental.

'dependence' and grounding as, for lack of a better term, 'logical realization.'[33] Part of that difference is manifested in how things ground and how things are grounded (as made clear in the previous paragraph). And so a failure to account for this difference is a failure to capture what seems to be a natural joint in grounding. Because of this, we need to be careful not to conflate these two kinds of grounding. More to the point, we need to be careful in using instances of one kind of grounding as counterexamples to a principle of the other.

1.e A milder alternative

Perhaps Uniqueness is too severe. In having it that the sharing of a ground suffices for the identity of the grounded, some may think so. So why not have it that what suffices for identity is the sharing of *all* the full grounds and not merely *some* full ground (Saenz 2015, 2210)? Where the objects ranged over by x and y are grounded, here is a milder principle

Mild Grounding Uniqueness. $\forall x \forall y \forall \Gamma((\Gamma < x \leftrightarrow \Gamma < y) \rightarrow x = y)$

('Mild Uniqueness' for short). Plainly put, if x and y share all their grounds, then x is y. Now Mild Uniqueness makes possible certain cases of grounding that Uniqueness does not. Here are two.

Skipping   Branching
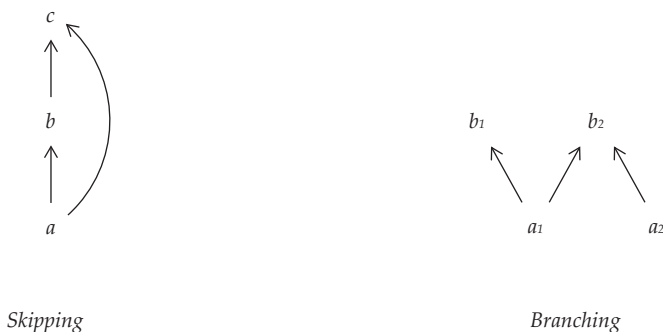
Mild Uniqueness is consistent with grounding-skips since, as seen in the left diagram, c is, but b is not, grounded in b. And it is consistent with grounding-branches since, as seen in the right diagram, b_2 is, but b_1 is not, grounded in a_2. So Mild Uniqueness is consistent with something grounding more than one thing. Many might see in this a reason to prefer it to Uniqueness. Still, it alone will not do. We need Uniqueness.

Given the premises of our argument for Uniqueness, two things cannot share a ground. But Mild Uniqueness permits two things to share a ground. So it is inconsistent with these premises. And it follows from this that, given our argument for Uniqueness, Mild Uniqueness alone will not do.

Now Fix played a big role in getting Uniqueness. But then maybe the right move is to opt for a milder version of it. Where 'Δ' is a plural variable, consider

$$\forall x \forall \Gamma((\Gamma < x \ \& \ Fx \text{ because } G\Gamma) \rightarrow \forall y(\forall \Delta(\Delta < x \leftrightarrow \Delta < y) \rightarrow Fy)).$$

That is, if x and y have all the same grounds, then if x is F because its grounds are collectively G, y is also F. Dropping Fix and going in for this milder version gets us Mild Uniqueness but not Uniqueness. But we should not drop Fix.

Recall the grounding problem between Statue and Lump: how can Statue, but not Lump, be a statue given that what explains that Statue is a statue (some fact about its microstructure) is also true of Lump? Notice that this problem remains whether or not Statue and Lump share *every* one of their

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[33]For a similar claim, see Turner (2016).

full grounds. Once we see that they share *a* full ground (their microstructure), the problem rears its ugly head. Or considering the above branching diagram, suppose someone claimed that b_1 is F because a_1 is G but went on to claim that b_2, in spite of being grounded in a_1, is not F. Do we not have a grounding problem here? How can it be that what explains that b_1 is F is also true of b_2 and yet, somehow b_2 is not F? And this problem remains even if b_1 and b_2 do not share all their grounds (as they do not). Their sharing a ground is enough to generate a grounding problem. And so this milder version of Fix is, even if true, too mild to do justice to our difference making intuitions.

Consider an even milder version of Fix:

$$\forall x \forall \Gamma ((\Gamma < x \ \& \ Fx \text{ because } G\Gamma) \rightarrow \forall y (\square \forall \Delta (\Delta < x \leftrightarrow \Delta < y) \rightarrow Fy)).$$

This says that if it is necessary that x and y have all the same grounds, then if x is F because its grounds are collectively G, y is also F.[34] That this version of Fix is insufficient is even easier to see. Possibly, what grounds Statue does not ground Lump (there are worlds where Statue but not Lump exists). And possibly, what grounds Lump does not ground Statue (there are worlds where Lump but not Statue exists). So it is not necessary that they have exactly the same grounds. Still, the grounding problem between them remains: their sharing a ground (their microstructure) suffices for it to be problematic that they differ. But then we should keep Fix. And if Fix, then Uniqueness.

2. The work

2.a Transitivity

Suppose that grounding is irreflexive. Then not only is Uniqueness inconsistent with

Transitivity. $\forall x \forall y \forall z ((x < y \ \& \ y < z) \rightarrow x < z)$,

it entails that all cases where x grounds y and y grounds z are cases where x does not ground z. Uniqueness thus has it that grounding is *intransitive*. Though Uniqueness permits chains of grounding, it does not permit grounding to skip a joint in the chain. This result is strong (and for some highly objectionable). In having it that grounding is intransitive, Uniqueness goes beyond what those in the literature have committed to when they reject Transitivity (Schaffer 2012; Rodriguez-Pereyra 2015).[35] Given that they rely on counterexamples to Transitivity, they can at most conclude that grounding is not transitive.[36]

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[34]This mildest version of Fix yields Mildest Grounding Uniqueness: $\forall x \forall y \forall \Gamma (\square (\Gamma < x \leftrightarrow \Gamma < y) \rightarrow x = y)$.

[35]There is a sense in which it does not go beyond what those in the literature have committed to. As Jon Litland pointed out, counterexamples to Transitivity purport to show that a certain relevance constraint fails to be satisfied when we chain. That is, counterexamples to Transitivity purport to show that there are cases where $x < y$ and $y < z$ and x is not appropriately relevant to z. Uniqueness does not have this implication (which I take to be a good thing). There is nothing about Uniqueness that bars x from being relevant to z even when x does not ground z.

[36]Now if Uniqueness is inconsistent with Transitivity, it is inconsistent with

Cut. $\forall x \forall y \forall w \forall z ((x < y \ \& \ y, w < z,) \rightarrow x, w < z)$

since the latter entails the former. The proof is straightforward. From Cut we get $(x < y \ \& \ y, y < z,) \rightarrow x, y < z$ and $(x < y \ \& \ y, x < z) \rightarrow x, x < z$. Given the principle of absorption for plural terms $(x, x = x)$, it follows that

1. $\forall x \forall y \forall z ((x < y \ \& \ y < z) \rightarrow x, y < z)$
2. $\forall x \forall y \forall z ((x < y \ \& \ y, x < z) \rightarrow x < z)$.

Assume that $x < y$ and that $y < z$. So from 1 we have $x, y < z$. Now given a principle of commutativity for plural terms, from $x < y$ and $x, y < z$ we get, via 2, $x < z$. We thus get from conditional proof: $(x < y \ \& \ y < z) \rightarrow x < z$, which is Transitivity.

But Uniqueness tells against Cut in a more direct manner. Assuming that $x < y$ and that $y, x < z$, it follows from 2 that $x < z$. Since $y \neq z$ on account of partial grounds not being identical with what they partially ground, it follows that x grounds both y and z. Since this violates Uniqueness, 2, and so Cut, must go.

Suppose though that one wanted to hold on to Transitivity. What premise or assumption of our argument for Uniqueness should they reject? Fix. But for reasons already given, this is a hard sell. Assuming that y is F and that z is not F, if x grounds y and y grounds z, then on pain of thinking that z is F, we should not think that z is the way it is because x is the way it is. But then we should not think that z is grounded in x. Being grounded in x is one thing. Being grounded in something that is grounded in x is another. And this is exactly what Uniqueness, by way of Fix, brings to light.[37]

2.b Ontology

Uniqueness has several implications when it comes to ontology. Here I discuss those having to do with priority monism, sums, sets, and qualitativism.

Priority Monism. According to priority monism, the cosmos grounds all its proper parts (Schaffer 2010b). So if Uniqueness is true, then priority monism is not.

How should the priority monist respond? She can say that it is *how* the cosmos is, and not simply the cosmos, that grounds its proper parts. So that the cosmos is *me-ish*, bears *me-ness* to here, or is *here-me-ish*, grounds me and that the cosmos is *you-ish*, bears *you-ness* to there, or is *there-you-ish*, grounds you. This may or may not work. It certainly needs fleshing out. But even if it does work, notice what Uniqueness has done. A virtue of priority monism is supposed to be its offering a sparse base on which to ground all the cosmos's proper parts. In so far as ontological simplicity is measured in terms of the number of things at the fundamental level (more on this below), in comparing priority monism with priority pluralism, the former is economically preferable. However, if what grounds the proper parts of the cosmos are facts involving the cosmos such that for each proper part (or maybe for each atomic part), there is some way the cosmos is that uniquely grounds this proper part, then the number of things at the fundamental level will have greatly increased: one for each part of the cosmos. So understood, priority monism's economical advantage is either lost or not as impressive as we thought.[38]

The priority monist can say something else. What the cosmos grounds are not its parts taken *individually*, but its parts taken *collectively*. So neither me, you, nor any other proper part of the cosmos is grounded in the cosmos. But we are taken collectively! This construal of priority monism yields a nice symmetry between it and standard accounts of priority pluralism. The latter says that the proper parts of the cosmos (or facts involving these parts), taken collectively, ground the cosmos. The mirror view of this is simply that the cosmos grounds its parts collectively. Be this as it may, that pluralities can be grounded is a radical thesis (or is at least something many do not accept).[39] Uniqueness thus yields something of import in potentially forcing the priority monist to accept something that many think is false when it comes to the nature of grounding.[40]

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[37] A referee suggests that even if Uniqueness entails that Transitivity is false, one could retain the spirit behind Transitivity by theorizing in terms of the transitive closure of grounding, grounding*. I agree. Keep in mind though that theorizing in terms of grounding* is rather different than theorizing in terms of grounding. For these relations non-trivially differ. If x grounds y, then y is the way it is because x is the way it is. Not so for grounding*. As I said in the main text, being grounded in x is one thing. Being grounded in something that is grounded in x is another.

[38] A referee points out that the priority monist might still have an advantage here. Arguably, the priority monist only needs to posit one fundamental particular and numerous fundamental facts, whereas the pluralist needs to posit not only numerous fundamental facts but also numerous fundamental particulars. Our question now is, does the priority monist have to posit more facts than the priority pluralist? Matters here are unclear and will depend on how exactly the grounding story goes. Suffice to say, even if priority monism still has a simplicity advantage, that advantage is not nearly what it seemed to be (and because this is so, counterbalancing it with advantages that the priority pluralist has becomes much easier).

[39] For someone who argues in favor of pluralities being grounded, see Dasgupta (2014).

[40] As a referee points out, it is tempting to think that if the cosmos grounds its parts collectively, then each part of it is individually fundamental. After all, if we measure the ontological simplicity of a theory in terms of the fundamental objects it posits, and if what it is to be fundamental is to be ungrounded, then the collective version of priority monism entails that each proper parts of the cosmos is fundamental. But then the collective version of priority monism seems to be no simpler than its pluralistic counterpart! Here though, there is something to say (Dasgupta 2014, 24). Given that pluralities can be grounded,

There are other views that, on the face of it, share with priority monism the thought that, for some collection of things, all are grounded in one. One particularly interesting view involves God and claims that all of creation, and so each created thing, is grounded in God (Sullivan 2015, 279; Craig 2017, chap. 1; Pearce 2017; Hamri 2018). So understood (but perhaps we should not understand it this way; perhaps this description of this view is elliptical for some other grounding claim), this view must go. Given Uniqueness, nothing can ground more than one thing. And so, even if God is the cause of all else, God is not the ground of all else.[41]

Sums and Sets. The following seems attractive: all it takes to ground a sum and a set of some things are those things. Thus, if we have some things, then we have them grounding their sum and their set. Since this contradicts Uniqueness, something must give.

Perhaps sets should give? Assume then that there are sums but no sets. So for any plurality greater than one, Uniqueness has it that such a plurality grounds and only grounds a sum. But then it follows that for anything collectively grounded in two or more things, it is a sum! This seems false: structured material objects (like chairs) and structural properties (like methane) are grounded in pluralities and neither kind of thing is a sum. So maybe sums should give? Assume then that there are sets but no sums. So for any plurality at all, Uniqueness has it that such a plurality grounds and only grounds a set. Thus, all grounded things are sets! This too seems false: there is more to derivative reality than sets. There are also material objects and properties, neither of which we are compelled to identify with sets.

Perhaps what should give is that sums and sets are grounded *only* in their parts and members? If so, then the popular thought that sums and sets are "ontological free lunches" should no longer be believed. Either sums and sets must go or they cannot be had merely on the basis of their parts or members.[42]

Uniqueness and that wholes are grounded in their proper parts entails a well-known uniqueness principle (where 'PP' expresses proper parthood and the objects ranged over by x and y are composite objects):

$$\forall x \forall y \forall z \big((\mathrm{PP}zx \leftrightarrow \mathrm{PP}zy) \rightarrow x = y\big).$$

Uniqueness and that sets are grounded in their members entails another well-known uniqueness principle (where '$\in$' expresses set-membership and the objects ranged over by x and y are sets):

$$\forall x \forall y \forall z \big((z \in x \leftrightarrow z \in y) \rightarrow x = y\big).$$

That we, in part, get these principles from Uniqueness is not surprising. As discussed earlier, Uniqueness is one way of capturing the slogan that there can be no difference without different

what one should say is that something is fundamental just in case it is not among a plurality that is grounded. After all, the fundamental things are those things that God had to think about in creating the world. And, if pluralities are grounded, then God did not have to think in terms of those grounded pluralities and so did not have to think in terms of the things among such pluralities. All God had to think in terms of are those pluralities that are not grounded. Given this, the fundamental things are nothing more than those things that are not among those pluralities that are grounded. (I leave it to the reader to decide whether revising the notion of fundamentality in this way is a feature rather than a bug.)

[41]Another set of views, recently discussed by Saucedo (Forthcoming), is worth mentioning. Priority monism has it that, for some collection of things, all are grounded in *one*. These other views have it that, for some collection of things, all *individually* are grounded in all *collectively*. Put differently, these views have it that, for some collection of things, *they* ground *each* of them; the *things* ground each *thing*. (Saucedo gives special attention to the view that says that *all* the things, taken collectively, ground each thing.) There is a good deal to say about these 'ontological collectivist' views. Here, it will do to say that, so understood, each must go. In having it that many things are grounded, not in one thing, but in one *ground* (where the ground is a plurality of things), such views contradict Uniqueness. And so, even if the things contain each thing, they do not ground each thing.

[42]As a referee suggests, perhaps what grounds sums are their parts *plus* sum-generation principles. And perhaps what grounds sets are their members *plus* set-generation principles. Perhaps. But that is just to say that sums and sets are not had merely on the basis of their parts or members and so are things over and above those parts and members.

makers. And given this slogan and the claim that what "makes" wholes and sets are, respectively, their proper parts and members, these principles follow. But, as seen a few paragraphs ago, we have been given reason to think that what "makes" wholes are not their proper parts and that what "makes" sets are not their members. And what follows from this is not that these principles are false, but that they should not be seen as genuine instances of the above slogan. (Indeed, once we grant that wholes are not grounded in their proper parts, it is no longer obvious what the problem is with thinking that two wholes can have the same proper parts. If what grounds wholes are various facts involving their proper parts, then it can be that some facts involving these proper parts ground one whole and that some other facts involving these same parts ground another whole [Saenz 2015]. This, because it posits different grounds for different wholes, is consistent with Uniqueness.)

Qualitativism. As I am understanding it, this is the view that at the fundamental level, there are only qualitative facts and that these facts ground individuals. But there is an argument from Uniqueness against it:

1. A Max Black world (a world with two indiscernible spheres) is possible.
2. If a Max Black world is possible, then if Uniqueness is true, qualitativism is false.
3. If Uniqueness is true, qualitativism is false. (1, 2)
4. Uniqueness is true.

Hence,

5. Qualitativism is false. (3, 4)

Though some have denied it, 1 is reasonable (Adams 1979). And we can assume 4 in the present context. So it all hangs on 2. But 2 is true. In a Max Black world, spheres A and B are qualitative duplicates. But then if Uniqueness is true, and so true in a Max Black world (Uniqueness is not a contingent truth), A and B cannot share a ground. But then, on pain of sharing a ground, A and B cannot be grounded in their qualitative natures. And from this it follows that qualitativism is false. Thus, 2.

In talking of the grounds of the fact that A exists and of the grounds of the fact that B exists, Dasgupta gets close to following this line of reasoning. Though he mentions nothing like Uniqueness, it seems to be lurking behind the following quote:

> But, one would argue, the qualitative facts that explain A's existence must be different from those that explain B's. After all, if one asked what explains A's existence and got an answer, and then asked what explains B's existence and got the very same answer, one would naturally want to reply "Wait a minute, that was what explained A's existence; what then makes it the case that B exists?" … the charge is now that there is no plausible explanation of their existence. (2014, 26)

How does Dasgupta avoid this worry with qualitativism? Not by doubling down and affirming with grounding orthodoxy that something can ground two or more things. Rather, he thinks that the qualitativist should go in for the grounding of pluralities. So what the qualitative facts ground are not A and B individually (or that A exists and that B exists), but A and B collectively (or facts involving A and B taken collectively). And going this route is tantamount to rejecting 2. Given Uniqueness then, we have reason to accept that if qualitativism is true, then pluralities are grounded. Since I reject that pluralities can be grounded, I see in this conditional a reason to reject qualitativism. But whether you tollens or ponens, Uniqueness has bite in potentially forcing the qualitativist, like the priority monist, to something most reject when it comes to grounding.

Grounding Problems. Unsurprisingly, we can construct a grounding problem for the above views. I am a person. My computer is not. We thus differ sortally. But given the standard way of

understanding priority monism, and so given that my computer and I have the same ground in the cosmos and are the ways we are because of how the cosmos is, how is it that we can differ in this way?[43] Or take qualitativism. A, the first iron sphere in a Max Black scenario, occupies region R. B does not. But given qualitativism, how can it be that they differ in this way? Something about those qualitative facts that ground A explains that A occupies R and yet, in spite of B being grounded in the very same facts, B does not occupy R. This is puzzling.

That we have these grounding problems is not surprising. As we saw at the beginning of this paper, once you have it that two things can share a ground, then given Fix and some plausible assumptions, it becomes puzzling how such things can differ. That is, once you reject Uniqueness, then given Fix and some plausible assumptions, you have a grounding problem.

2.c Ontological simplicity

Many now think that when it comes to ontological simplicity, derivative things cost no more than their grounds.[44] And if true, then a good methodology would be a bang-for-your-buck one where one gets the most one can at derivative levels from the least one can at more fundamental ones (Schaffer 2009, 361).

I find this methodology attractive. But we need to be careful. As I hope the reader now sees, things can get out of hand if one does not wield it wisely. There are two ways to get a bang for a buck. The first is captured in the diagram on the left, where the bang proceeds *linearly*. The second in the diagram on the right, where the bang proceeds *branchly*.

A Linear Bang: Possible   A Branchy Bang: Impossible
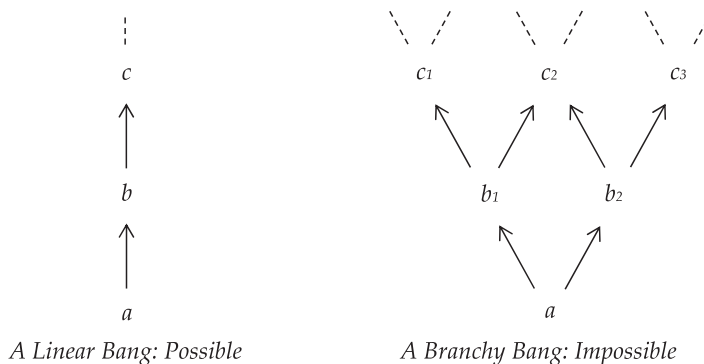
But on pain of contradicting Uniqueness, the bang-for-buck methodology should not be wielded in ways that result in branchy bangs. If you want the biggest bang for your buck, you must proceed linearly, yielding tall and slim, and not wide and fat, trees.

Given this, if a theory has n things in any given non-fundamental level, the level below it must have n grounds (or more if overdetermination occurs). The theory cannot, as concerns the number of *grounds*, slim as we go down. It can, however, slim in the number of *things*. Consider a theory that has only two fundamental things, a_1 and a_2. From them we are, in principle, able to ground three things: a_1 may ground one thing, a_2 another, and a_1, a_2 a third. So in spite of their being three grounded things and so three grounds (a_1 and a_2 and a_1, a_2), the theory slims from three things to

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[43]Sider (2008b, 144–47) gives a somewhat similar grounding problem for priority monism except that appeal is made to natural properties, a global supervenience principle involving natural properties, and talk of subworld objects microfictionally satisfying an open sentence.

[44]See Schaffer (2007, 189; 2015), Cameron (2010, 250), Sider (2013a, 240), and Bennett (2017, 220–29).

two as we go down.[45] This then is a way a theory can slim as we go down or branch as we go up. So where n is the number of things we start with, the maximal number of things we can ground from n is 2^n-1. Any theory that grounds more than this from n things contradicts Uniqueness.

Uniqueness explains a well-known trade-off. In general, and ontologically speaking, the more fruitful a theory is the less economical and the more economical a theory is the less fruitful. But what is the coin by which, in general, increasing one decreases the other? The answer, I think, is found in Uniqueness. Consider the ontologies discussed in section 2.b, each of which violate this trade-off. In them we were able to get so much from so little. Now if we want to rid ontology of this magic, we need Uniqueness. If we want a theory whose fruits are many, Uniqueness says that we need a theory less economical than one whose fruits are few (the exception being cases where a theory has not maximized the work its more fundamental things can do). So Uniqueness is the coin that explains the tradeoff. If you start off with one fundamental thing but want, at the next level, two derivative ones, you must widen the base. More generally, if at level L you start with n things but want, at $L+1$, more than 2^n-1 things, you must widen L. No surprise then that the more fruitful a theory is the less economical and the more economical a theory is the less fruitful.

In addition to constraining a methodology and explaining a trade-off, Uniqueness shows us why the following objection to this methodology does not work (Schaffer 2015, 656–58; Turner 2016, 382–85). Take an atomistic model of classical mereology which generates 2^n-(n+1) composites from n atoms. Contrast this with 'doubled mereology,' according to which for every non-atomic thing that exists according to classical mereology, there is its double composed from exactly the same parts.

Now doubled mereology is supposed to tell against the bang-for-buck methodology. The thought is that in spite of getting a bigger bang from the same buck, doubled mereology is worse off as concerns simplicity than is classical mereology on account of its involving redundant things; composites that do no more work than their classical twins. But whether you have this seeming or not, appealing to doubled mereology in order to tell against this methodology is misguided and we can see why. Doubled mereology is inconsistent with Uniqueness. And that it is explains why some might be inclined to think that it yields redundant things. The doubled entities that doubled mereology yields appear redundant on account of having the same grounds as their classical twins. Absent this sharing of grounds, there would be no obvious redundancy — grounding numerically distinct composites in numerically distinct atoms does not, on its own, give us reason to think that these composites are redundant with respect to each other. Assuming then that there is no sharing of grounds by composites, there is no reason to think that such composites are redundant. We only get doubled mereology and its redundant composites because we are assuming that these composites share a ground. But we should not. By means of Uniqueness, grounding prohibits such multiplying. So because this kind of multiplying is prohibited by grounding, doubled mereology should not be used to tell against the present bang-for-buck methodology. And if it should not be used to tell against this methodology, then the reason it gives to think that derivative things cost more than their grounds is not a reason that should move us. So given what is built into grounding, it is right to look to maximize one's bang from one's buck.

3. Closing

There is a trend Uniqueness bucks. Many think that grounding and cognate notions should be neutral across varying ontologies (Jenkins 2011, 269–70; Fine 2013, 728; Dasgupta 2014, 3; Leuenburger 2014, 158, 163; Barnes 2018, 55). For instance, Barnes has it that a theory of dependence should not "rule out wide swathes of the metaphysical landscape." And Fine has it

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[45]I thank Louis deRosset for pointing this out.

that a theory of fundamentality should accommodate coherent and plausible positions, and not "exclude a position simply on the grounds that it does not conform to our theory."

I say no to this. Uniqueness tells against wholes grounding their parts, members their sets (given some plausible assumptions), summands their sums (given some plausible assumptions), and qualitative facts individuals (given Max Black worlds). These views are coherent and have some plausibility, but are thrown in the ontological trash bin by Uniqueness.

Some will see in this a vice. I see in it a virtue. If grounding is to have content, then the work it does will extend beyond its ability to characterize various positions and frame various disputes. It will also say something about what kinds of things exist and what kinds of things ground what. So it *will* decide various positions.[46] A theory of grounding that embraces Uniqueness lets grounding say this. And it lets it say this by demanding that grounds are lush enough to discriminate between less fundamental things. A good ground for something will be a reason why this something, and not anything else, exists or is instantiated.

To close, many will find Uniqueness hard to accept. In taming the grounds, it runs roughshod over several things people want to say. So embracing it will not come easy. Still, to those who endure its stern hand, Uniqueness yields something attractive. A theory of grounding that has it is a beautiful theory—elegant and trained, respecting the liberal's desire for more with the conservative's disdain for too much.

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[46]I agree with Sider (2013b) when he says that "fundamentality is just another metaphysical issue, rather than a "first metaphysics" that lays out a neutral playing field in which all other metaphysical theories can compete" (741).

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