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# Turtles all the way down: Regress, priority and fundamentality in metaphysics<sup>1</sup>

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## Abstract

This paper is a discussion of an intuition commonly held by metaphysicians: that there must be a fundamental layer of reality; that chains of ontological dependence must terminate; that there cannot be turtles all the way down. I discuss application of this intuition with reference to Bradley's regress, composition, realism about the mental and the cosmological argument. I discuss some arguments for the intuition, but argue that they are unconvincing. I conclude by making some suggestions for how the intuition should be argued for, and discussing the ramifications of giving the justification I think best.

A well-known scientist (some say it was Bertrand Russell) once gave a public lecture on astronomy. He described how the Earth orbits around the sun and how the sun, in turn, orbits around the centre of a vast collection of stars called our galaxy.

At the end of the lecture, a little old lady at the back of the room got up and said: "What you have told us is rubbish. The world is really a flat plate supported on the back of a giant tortoise."

The scientist gave a superior smile before replying, "What is the tortoise standing on?"

"You're very clever, young man, very clever," said the old lady. "But it's turtles all the way down."

– From Stephen Hawking's *A Brief History of Time*.<sup>2</sup>

## 1: Bradley's regress

We are familiar with Bradley's regress.<sup>3</sup> Suppose  $a$  is  $F$ . Suppose, for reductio, that it follows that a relation of instantiation holds between  $a$  and  $F$  – symbolise this as  $RaF$ . But now, it seems,  $R$  holds between  $a$  and  $F$ , and there is just as much reason to think that a relation of instantiation must bind  $R$ ,  $a$  and  $F$  as there was to think that a relation of instantiation must bind  $a$  and  $F$ . So a relation holds between  $R$ ,  $a$  and  $F$  . . . And we're off on a regress to infinity.

But what exactly is the problem here? It depends: does the same instantiation relation hold in each case, or is it a different one in each case?

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<sup>1</sup> Thanks to Elizabeth Barnes, Andrew McGonigal, Jonathan Schaffer, and Robbie Williams for helpful discussion.

<sup>2</sup> Hawking, (1989, p1)

<sup>3</sup> Bradley (1893)

Suppose it is the same. A relation may have infinitely many instances, so what is the problem in there being an infinite ‘regress’ of instances of the instantiation relation?

Let me introduce some notation before we proceed. If  $a$  is  $F$  let us say that there is an instantiation property that applies to the ordered pair  $\langle F, a \rangle$ : that is, there is a property,  $R$ , such that the ordered pair  $\langle x, y \rangle$  instantiates  $R$  if and only if  $x$  instantiates  $y$ .

The regress, then, is as follows. If  $a$  is  $F$ , then the property of instantiation,  $R$ , is had by the ordered pair  $\langle F, a \rangle$ :  $R(\langle F, a \rangle)$ . So  $\langle R, \langle F, a \rangle \rangle$  has the property of instantiation, i.e.  $R(\langle R, \langle F, a \rangle \rangle)$ , and so  $\langle R, \langle R, \langle F, a \rangle \rangle \rangle$  has the property of instantiation. And so on . . . The regress never looks vicious because we arrive at a different ordered pair at each stage. It seems the problem must be that there are an infinite number of ordered pairs that instantiate the instantiation property. But why is this a problem? There is no general metaphysical bar on properties having infinitely many instances.

Suppose instead that a different instantiation relation is invoked at each stage. When  $a$  is  $F$  there is a relation that binds together  $a$  and  $F$ , call it  $R_1$ . So there is a relation that binds together  $a$ ,  $F$  and  $R_1$ , call it  $R_2$ . So there is a relation that binds  $a$ ,  $F$ ,  $R_1$  and  $R_2$  together, call it  $R_3$ . And so on . . . We have an infinite number of instantiation relations. Again, what’s meant to be the problem? There is no metaphysical bar on there being infinitely many entities in general, so why should infinitely many instantiation relations create a problem?

Perhaps the problem is meant to be that we shouldn’t have an a priori proof that there are infinitely many instantiation relations: it shouldn’t be a consequence of the apparently innocuous fact that  $a$  is  $F$ . But I won’t dwell on this concern: metaphysicians have traditionally been quite content to give us a priori reasons for thinking the world to be a certain way, and this seems no worse than any others.

So what is the problem? What’s wrong with Bradley’s regress? There have been some attempts to extract a logico-linguistic puzzle from Bradley’s regress, but none of the results seem very problematic.<sup>4</sup> I want, instead, to try to draw out a metaphysical problem based on the following thought. The instantiation relation binding  $a$  and  $F$  is what *explains* why  $a$  is  $F$ . So the obtaining of this relation between particular and universal is ontologically *prior* to the fact that  $a$  is  $F$ : the state of affairs  $R(\langle F, a \rangle)$  is ontologically prior to the state of affairs  $F(a)$ . It is in virtue of the obtaining of the former fact that the latter fact obtains;  $a$  is  $F$  because  $a$  instantiates  $F$  – because the instantiation relation binds the universal  $F$ -ness to the particular thing  $a$ . But by the same reasoning, the obtaining of  $R(\langle R, \langle F, a \rangle \rangle)$  is ontologically prior to the obtaining of  $R(\langle F, a \rangle)$ . The reason why the instantiation relation binds  $a$  and  $F$  together is that the instantiation relation binds the instantiation relation to  $a$ ’s being  $F$ . And so on . . . (Alternatively: the state of affairs of  $R_2$  binding together  $R_1$ ,  $a$  and  $F$  is ontologically prior to the state of affairs of  $R_1$  binding together  $a$  and  $F$ , which is ontologically prior to the state of affairs of  $a$  being  $F$ .)

If this reasoning is correct, then Bradley’s regress starts to look more worrying. It’s not just that there are infinitely many instantiation relations, or that the instantiation relation applies to infinitely many things. The worry, rather, is that there are infinitely

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<sup>4</sup> See Gaskin (1995) for a nice discussion of such problems.

many levels of facts, the obtaining of each depending on the obtaining of the facts at the next level. The trouble is that it is hard to see how things could get off the ground in the first place.

The thought is that while there is no general problem with completed infinities, there is a problem if metaphysical explanation never ‘grounds out’ at some fundamental level. While you can have a fundamental level and have infinitely many things dependent on that level, you can’t have dependence all the way down.

There are answers to Bradley’s regress, of course. Armstrong<sup>5</sup> denies that any state of affairs need be ontologically prior to the state of affairs of a being F. Sure, a being F entails that a instantiates F-ness, which entails that a and F-ness are related in a certain way, which entails that a, F and instantiation are related in a certain way, etc. But all these truths are necessitated by the one state of affairs: a’s being F. The single state of affairs is the *truthmaker* for each of the infinitely many truths appearing on Bradley’s list, so there is no regress in ontology. The mistake in the metaphysical form of Bradley’s regress is to think that the state of affairs of a being F is dependent on a further state of affairs: that of a and F being related by the instantiation relation. There is no state of affairs of a and F being related by the instantiation relation. There is a true proposition <instantiation holds between a and F>; but this is made true simply by the state of affairs of a being F.

Perhaps Armstrong’s response to the metaphysical version of Bradley’s regress succeeds. Here, however I’m interested in whether it should have been taken seriously in the first place. Should we uphold its driving intuition – the intuition against metaphysical dependency all the way down?

### Digression: Some terminology

It will be useful at this point to stop and introduce some terminology. I will take as primitive the relation of *ontological dependence*. Ontological dependence is transitive, irreflexive and asymmetric. This relation cannot be analysed, but I think we have a good grasp of it: it is the relation that any impure set bears to the individuals in its transitive closure – so {a} is ontologically dependent on a, as is {{a}}. The converse of ontological dependence is ontological priority: so a thing is ontologically prior to its singleton, and to the singleton of its singleton, etcetera.

The derivative relations of *direct ontological priority* and its converse *direct ontological dependence* are irreflexive, asymmetric, non-transitive (i.e. neither transitive nor intransitive) relations. *x* is *directly ontologically prior* to *y* iff (i) *x* is *ontologically prior* to *y*, and (ii) there is no *z* such that (a) *x* is *ontologically prior* to *z*, and (b) *z* is *ontologically prior* to *y*. The idea here is that there is something special about the relationship between a and {a} as opposed to the relationship between a and {{a}}. a is ontologically prior to both {a} and {{a}}, but it is not *directly* ontologically prior to {{a}}.

I do not assume that if *x* is directly ontologically prior to *y* then there is no *z*≠*x* such that *z* is directly ontologically prior to *y*, nor do I assume that there is no *v*≠*y* such that

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<sup>5</sup> Armstrong (1997), p157-158.

x is directly ontologically prior to v. I reject the latter assumption because I believe in tropes and I think substances are ontologically prior to each of the many tropes that inhere in them. I reject the former assumption because it seems likely that the pair set {a,b} is directly ontologically dependent on both a and b.

An entity  $e_n$  has its *ultimate ontological basis* in the entities  $e_1$  to  $e_m$  iff (i) all of  $e_1$  to  $e_m$  are ontologically independent entities and (ii) there is a chain of ontological dependence linking  $e_n$  to one or more of  $e_1$  to  $e_m$ . There is a chain of ontological dependence linking  $e_n$  to one or more of  $e_1$  to  $e_m$  iff there is a set of entities  $S_1$  every member of which is ontologically prior to  $e_n$  and either (i) every member of  $S_1$  is one of  $e_1$  to  $e_m$  or (ii) for every member of  $S_1$ , call it  $e_x$ , there is a set of entities,  $S_x$ , every member of which is ontologically prior to  $e_x$  and either (i) every member of  $S_x$  is one of  $e_1$  to  $e_m$  or (ii) . . . etc.

An entity x is *ontologically independent* (or *fundamental*) iff there is no entity y such that x ontologically depends on y, ontologically dependent otherwise. It is false to say that an entity x is ontologically independent iff there is no entity y such that x is directly ontologically dependent on y; that thought makes appeal to the following assumption: that for any dependent entity, there is a finite number of steps taking you from it to its ultimate ontological basis. This should be rejected.

The intuition under discussion does not demand that we should be able to reach the ultimate ontological ground in a finite number of steps (which is why we can't take direct ontological dependence as primitive and define the transitive notion of ontological dependence in terms of it). It demands only that there is a fundamental ground. This is compatible with no entity's depending directly on that fundamental ground, but rather every entity's having a chain of dependence with an infinite number of steps taking that entity to the ultimate ground. Suppose, for example, that one held the following three theses: (1) the only ontologically independent (mathematically) real number that exists ontologically independently is zero, (2) for any two positive real numbers, x and y, x is ontologically prior to y iff  $x < y$ , (3) for any two negative real numbers, x and y, x is ontologically prior to y iff  $y < x$ . In that case, no dependent entity is directly dependent on an independent entity; for every dependent entity x, there is an infinite chain of ontological dependence linking x to its ultimate ontological basis – zero.

The intuition is just as strong regarding facts as it is regarding objects. We speak of one fact obtaining directly in virtue of another. This is an irreflexive, asymmetric, non-transitive relation, the transitive notion being simply 'in virtue of'. The converse of these in-virtue-of relations is grounding: F directly grounds G iff G holds directly in virtue of F, likewise F grounds G iff G holds in virtue of F, iff the *ultimate metaphysical grounding* of G is in F, iff there is a chain of in-virtue-of relations linking G to F. A fact F is *brute* iff there is no fact G such that F holds in virtue of G, a fact is *derivative* otherwise. And the analogue of the grounding intuition is that there must be some brute facts to provide the ultimate metaphysical grounding for every derivative fact. I think the claims about objects and facts stand or fall together, so I will confine attention to the claim regarding objects and ontological priority.

2: Gunk

The thought behind Bradley's regress, understood metaphysically, was that dependence cannot go on ad infinitum: there must be a fundamental level which grounds all the dependent objects or derivative facts. This thought is quite intuitive. Contrast two cases: singletons and atomless gunk. Socrates exists and is the ontological ground of his singleton, because Socrates is directly ontologically prior to {Socrates} and is himself an independent entity. {Socrates} is directly ontologically prior to {{Socrates}}; but the ultimate ground of {{Socrates}} is Socrates, not {Socrates}. And so on . . . This is unproblematic because there is a fundamental level, and the existence of things at each non-fundamental level is explained by the existence of things at the level below. Everything which needs explaining is explained.

Now consider atomless gunk. A world is gunky iff it contains no simples: every (material) object is a complex object. Every thing has infinitely many proper parts, each of which has infinitely many proper parts, and so on. Is such a world possible? It depends on the nature of the relationship between a complex object and its parts. If neither complex object nor its parts is ontologically prior to the other, perhaps because they are identical, then there is no problem. Likewise, if monism is true, so the mereological sum of every material object is fundamental, and the proper parts are ontologically dependent on the whole<sup>6</sup>, then there is no problem.

(These aren't the only options, of course. Perhaps ordinary medium sized objects like persons, tables, houses, dogs etc are fundamental, and both their proper parts and their mereological sums ontologically depend on them. On this view there is a fundamental level and ontologically dependent entities are obtained both by composing and by decomposing.)

But if the complex object is ontologically dependent on its parts then gunky worlds look problematic. Again, when you have an infinite sequence of entities  $e_1, e_2, e_3, \dots$  it doesn't seem problematic to hold that  $e_2$  is dependent on  $e_1$ , and  $e_3$  dependent on  $e_2$  etc, but it *does* seem problematic if  $e_1$  is dependent on  $e_2$ , and  $e_2$  dependent on  $e_3$  etc. In the composition case, the anti-gunk worry is that composition could never have got off the ground. If the existence of each complex object depends for its existence on the existence of the complex objects at the level below, and if we never reach a bottom level, then it's hard to see why there are any complex objects at all.

Jonathan Schaffer is a monist, yet he does not deny that many things exist; instead he holds that there is only one *fundamental* existent (an ontologically independent entity, in my terminology): the world. And this is no contingent truth; for all worlds,  $w$ , there is exactly one fundamental entity at  $w$ : namely,  $w$  itself. One of Schaffer's arguments for this "priority monism" is that the pluralist would find it hard to account for the possibility of gunk. "Nothing is basic [for the pluralist, if the world is gunky]", he writes; "There would be no ultimate ground. Being would be infinitely deferred, never achieved." He concludes that "if the many parts are basic, gunk is not possible".<sup>7</sup> Here, of course, he relies on an the intuition at hand: that ontological dependence can't go on forever – one must hit the ground eventually.

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<sup>6</sup> See Schaffer (manuscript a), (manuscript b).

<sup>7</sup> Schaffer (manuscript a), Sec 2.4.

Leibniz gives a similar argument, but rejects the possibility of gunk rather than accept the priority of the whole over the parts. He says

Where there are only beings by aggregation [composite objects], there aren't any real beings. For every being by aggregation presupposes beings endowed with real unity [simples], because every being *derives its reality* only from the reality of those beings of which it is composed, so that it will not have any reality at all if each being of which it is composed is itself a being by aggregation, a being for which we must still seek further grounds for its reality, grounds which can never be found in this way, if we must always continue to seek for them.<sup>8</sup>

Again, then, we see the thought that if everything were dependent, there would be no grounding to being: there would be no end to explanation when we try to explain why what there is exists.

### 3: Realism about the mental

Before assessing this intuition against infinite descent in ontological dependence I will note another consequence of it: the intuition rules out a global non-eliminativist anti-realism about the mental.

Like Devitt<sup>9</sup>, I take realism to be a conjunctive doctrine: realism about the  $\Phi$ s is the view that (i) the  $\Phi$ s exist and (ii) the existence and nature of the  $\Phi$ s is not mind-dependent. Anti-realism, then, is a disjunctive doctrine: eliminativist anti-realists about the  $\Phi$ s deny that they exist; non-eliminativist anti-realists about the  $\Phi$ s accept their existence but hold that their existence or nature depends in some way on what we think about the  $\Phi$ s. But if infinitely descending layers of ontological priority are impossible then non-eliminativist anti-realism about the mental must fail.

Devitt's account of realism has sometimes been thought to face problems when applied to the mind. Realism about the mental would amount to the claim that mental entities exist mind-independently; but the mental trivially depends on the mental, so anti-realism about the mental is trivially true.

I don't think Devitt's account rules out realism about the mental. The notion of independence in the definition of realism should be understood, I think, as *essential* independence as opposed to *modal* independence.<sup>10,11</sup> Assuming for the sake of argument that any mind is essentially a mind, it is true, trivially, that minds *modally* depend on mental entities, in that they couldn't exist in a world without. But it doesn't follow that minds essentially depend on minds, in that their existence or essence is constitutively dependent on mental activity. Realism denies this essential dependence on mental activity, and is not trivially false.

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<sup>8</sup> Leibniz (1686-87, p85), my emphasis.

<sup>9</sup> Devitt (1984)

<sup>10</sup> Jenkins (2005) argues this in detail.

<sup>11</sup> The distinction between essence and modality is familiar from Fine (1994). An essential connection entails a necessary connection, but the presence of a necessary connection does not entail an essential connection.

Once we distinguish essential from modal mind-independence, and realise that realism is concerned with the former and not the latter, we can raise a problem for non-eliminative anti-realism about mental entities. If mental entities were mind-dependent they would be ontologically grounded in episodes of mental activity. But any episode of mental activity is itself a mental entity: namely, a mental event. So if a mental entity, ME, is mind-dependent there must be some distinct mental entity, ME\*, which is ontologically prior to ME. (Recall that ontological priority is irreflexive: nothing is its own ontological ground.) Likewise, if ME\* is mind-dependent, there must be some distinct mental entity that is its ontological ground. This chain of ontological priority can't go in a circle (since ontological dependence is both transitive and asymmetric), so either it goes on forever or else there is at least one mental entity that exists mind-independently. So if the suspicion against an infinitely descending sequence of entities, each one ontologically dependent on the entity below, is correct, then global mind-dependence with respect to the mental is not an option. Anti-realists about the mental must reject the existence of mental entities outright.

#### 4: Arguing for the intuition

Let us take stock. I have identified an intuition: that when there is an infinite chain of entities  $e_1, e_2, e_3, \dots$ , or an infinite chain of facts  $F_1, F_2, F_3, \dots$ , then while  $e_2$  may ontologically depend on  $e_1$ , and  $e_3$  ontologically depend on  $e_2$  etc, and while  $F_2$  may obtain in virtue of  $F_1$  and  $F_3$  in virtue of  $F_2$  etc, it is impossible for  $e_1$  to be ontologically dependent on  $e_2$ , and  $e_2$  ontologically dependent on  $e_3$  etc, or for  $F_1$  to obtain in virtue of  $F_2$  and  $F_2$  in virtue of  $F_3$  etc. There must be a metaphysical ground: a realm of ontologically independent objects which provide the ultimate ontological basis for all the ontologically dependent entities, and a realm of basic facts which provide the ultimate metaphysical grounding for all the derivative facts.

If this is correct, it has serious consequences. It forces us to take Bradley's regress seriously. It forces us to reject either the possibility of gunk or the claim that a complex object is dependent on its parts (in which case a strong case can be made for monism). And it forces us to reject a non-eliminativist anti-realism about the mental.

Leibniz also appears to rely on the principle in his version of the cosmological argument.<sup>12</sup> The familiar version of the cosmological argument, from Aquinas, says that every causal chain must originate in some first cause, and identifies God as the first cause. This isn't convincing because causal chains need not have a first member: even if the universe has only existed for a finite length of time, there could still be an infinite number of events in the causal chain, and no first event. (That is, assuming that there is no minimum duration of time it takes for a possible event to occur in. And even if this is rejected, why think the universe is only finitely old?) Leibniz replaced 'cause' with something like 'metaphysical ground'. He was guided by his principle of sufficient reason, which is the precursor to today's truthmaker principle: he held that every (contingent) truth must have some metaphysical grounding. This is meant to be an advance on Aquinas because Leibniz thinks it highly intuitive that metaphysical grounding, unlike causation, has to bottom out somewhere. If there is no first cause, if every causal chain is infinitely descending, we are not at all tempted

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<sup>12</sup> See, inter alia, Leibniz (1697), (1714, section 8, p210).



to say that nothing has a causal explanation; but if there is no ultimate fundamentality, there is the strong intuition that nothing has a metaphysical explanation. (Of course any version of the cosmological argument must also meet Russell's challenge and say why God's existence does not need a grounding outside of God, whilst the universe's existence needs a grounding outside of itself.<sup>13</sup>)

So what speaks in favour of this far-reaching intuition? Recall the gunk case. The intuition is that it's hard to see why there would be any objects at all, given that the existence of each depends on the existence of the objects at the level below, and so on ad infinitum. In Schaffer's charming phrase: "Being would be infinitely deferred, never achieved".

But why is this? Ontological priority isn't temporal priority. It's not as if God has to have made a, b and c previously (literally) if He is to make the sum of a, b and c. Why can't He just make them all together? Similarly, why can't He just make all the infinitely many things that inhabit the gunky world at once, together with the relations of ontological priority that hold between them? My concern is that the intuition rests on us taking too seriously the temporal metaphor suggested by 'priority'.

(Indeed, even if the ontological priority of a over b required God to create a before b it's not clear that the requisite infinitely descending chains would be impossible. Couldn't God just have performed a supertask, creating  $e_1$  at  $t$ ,  $e_2$  (which is directly ontologically prior to  $e_1$ ) a minute before  $t$ ,  $e_3$  (which is directly ontologically prior to  $e_2$ ) a minute and a half before  $t$ ,  $e_4$  (which is directly ontologically prior to  $e_3$ ) a minute and three quarters before  $t$ , etc?)

Another possible argument for the intuition rests on the thought that the fundamental is what is real, with the dependent being unreal or less real.<sup>14</sup> The thought is that if there were infinitely descending chains of dependence, of the sort ruled out by the intuition, then nothing would be real.

Suppose that the dependent is less real than what it depends upon. Moving along the chain from the fundamental to the dependent takes you from the real to the less real: if a is ontologically prior to b then a is more real than b. If we have an infinite sequence of entities closed at one end and open at the other, with an independent entity at the closed end, and each subsequent entity dependent on the entity before it in the sequence, then we know exactly what to say: the first entity is wholly real, the next a little less real, the next even less real, and so on. Every entity has some degree of realness. But if you have a dependent entity at the closed end, and every subsequent entity depending on the entity that comes after it in the sequence, we don't know what to say about any of the entities. None of them are wholly real, so how can any of them have any degree of reality?

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<sup>13</sup> Russell (1999, p79). Actually, Russell was talking about the causal version, but the same challenge arises for the Leibnizian version.

<sup>14</sup> Schaffer may have something like this in mind. In his (2003, p498) he says that an "ontological attitude according to which the entities of the fundamental level are *primarily* real, while any remaining contingent entities are at best derivative, if real at all" is "a natural (though not inevitable) conclusion" of the view of reality as "stratified into levels".

This is a poor argument for the intuition. Assume that the dependent is indeed less real than that which it depends upon. Any good reason for holding that if nothing is wholly real then nothing can have any degree of reality simply presupposes the truth of the intuition in question. Why couldn't everything get a bit more real as we progress down the chain, without anything being wholly real? My intuition (insofar as I understand what 'real' means; I'll come back to this below) rules this out; but this just is the intuition that there must be a fundamental level.

The other form of the argument looks a bit better: if realness doesn't come in degrees and only the fundamental is real then, if everything is dependent, nothing is real. But it is still not convincing. We need to know what 'real' means, and on no plausible reading is 'only the independent is real' true and 'nothing is real' obviously false.

If 'real' means 'fundamental', then the premise would be a tautology, but to assume the falsity of the consequence would clearly be to beg the question. 'Real' might mean 'exists'. But if 'real' means 'exists', then I think the non-fundamental is as real as the fundamental. The non-fundamental must exist in order for it to *be* dependent on the fundamental (or the more fundamental). Non-existent things aren't dependent entities – they're *nothing*! Nor does existence come in degrees, so that would be another nail in the coffin of the first form of the argument.

'Real' might mean 'mind-independent'. But while it *may* be the case that the things that exist at the fundamental level are mind-independent entities, whilst non-fundamental entities are mind-dependent, it is no part of the concept of ontological priority that this be so. There might be relations of ontological priority holding between the mind-independent entities even if nothing were mind-dependent. Moreover, 'nothing is real' would mean that everything was mind-dependent; but this is not obviously false. At least, it's not obvious why something must be mind-independent *unless* the argument in section 3 of this paper is correct, and we are convinced that there are some mental entities; but that argument relied on the intuition under question, so its conclusion can't be appealed to in an argument to establish the truth of that intuition. And if 'real' doesn't mean either existent or mind-independent then I don't know what it means; so I don't know of a convincing version of the above argument for the truth of the intuition.

Another potential justification for the intuition is familiar from the debate between Leibniz and Hume. Here, the thought is that if there could be an infinite chain of entities  $e_1, e_2, e_3, \dots$  such that  $e_1$  is ontologically dependent on  $e_2$ , and  $e_2$  ontologically dependent on  $e_3$  etc, then, while every entity in the chain is grounded, nothing grounds the chain itself. Even if there needn't be a first member of the chain – an independent entity that provides the ultimate ontological grounding for every member of the chain - there must be an ontologically independent entity to ground the existence of the chain itself.

But that's unconvincing. Grant for the sake of argument that not only must every being on the chain have an ontological grounding but the chain itself must have an ontological grounding. This doesn't entail that anything is an independent entity. Perhaps the chain of entities  $e_1, e_2, e_3, \dots$  depends on a further entity  $e^a_1$  which depends on  $e^a_2$ , which depends on  $e^a_3$  etc? And if someone asks "but what about the chain  $e^a_1, e^a_2, e^a_3 \dots$ ?" we can appeal to a new entity  $e^b_1$  which is the ontological

ground of this new chain, and which depends on  $e^b_2$  which depends on  $e^b_3$  etc. And so on. In each case, the infinite chain of entities is dependent on an entity which is itself the first member of another infinite chain. Provided we're prepared to postulate more and more entities, one for every cardinal number, then nothing will go ungrounded.

It's proving hard to argue for the intuition. Of course, it is an *intuition*: isn't that reason enough to believe it? Yes, it is; I certainly feel the force of the intuition strongly, and I think that this alone, given that I've seen no argument *against* the intuition, is sufficient to give me reason to believe that the intuition is true. We've got to rest on intuition at *some* point, after all; isn't here as good a place as any? Why should we even be trying to offer an argument for it?

I want to offer an argument because I want to have something to say to an opponent who does not share the intuition. The grounding intuition is not universally accepted, and I would like to be able to say more in defence of a principle that is a guiding principle of my metaphysics than 'it just seems true to me'. I want to offer a justification of the principle that my opponents will have to think about – a justification that won't exclude them right off the bat.

That's what's proving difficult. But maybe we're going about it the wrong way. We certainly shouldn't expect to be able to give an argument for every metaphysical principle from metaphysical principles that are more evidently true, for then we'd never stop. If we're going to do metaphysics at all, then at some point we've got to take a metaphysical principle as bedrock, and admit that it is not the conclusion of any valid argument the premises of which are on a stronger epistemic footing than the conclusion. Leibniz, for example, never gave an argument for the principle of sufficient reason, thus making him a target for the scepticism of Hume; rather, the principle of sufficient reason was his starting point. It seemed evident to him, and it became the guiding principle of his system. I propose that we offer the same status to the intuition against infinitely descending chains of dependence. But this doesn't mean we can't provide some reason to believe it. All I'm denying is that the intuition can be justified by any more basic metaphysical principle, and so it's a mistake to attempt to justify it in this way. I suggest instead that we try to justify it by appeal to theoretical utility.

If we seek to explain some phenomena then, other things' being equal, it is better to give the same explanation for each phenomenon than to give separate explanations for each phenomenon. A unified explanation for the phenomena is a theoretical benefit. That seems to provide some evidence for the intuition under discussion. For if there is an infinitely descending chain of ontological dependence then, while everything that needs a metaphysical explanation (a grounding for its existence) has one, there is no explanation for everything that needs explaining. That is, it is true for every dependent  $x$  that the existence of  $x$  is explained by the existence of some prior object (or set of prior objects), but there is no collection of objects that explains the existence of every dependent  $x$ . This is a theoretical cost; it would be better to be able to give a common metaphysical explanation for every dependent entity. We can do that only if every dependent entity has its ultimate ontological basis in some collection of independent entities, so this provides us with reason to believe the intuition against infinite descent in metaphysical explanation.

This won't convince someone who thinks this talk of ontological priority is all a lot of rubbish; but I'm not trying to do that. This paper isn't trying to convince you to believe in metaphysical explanation, only that *if* you believe in metaphysical explanation you should believe it bottoms out somewhere. If you believe in priority, you should believe in fundamentality.

## 5: Ramifications

I have suggested that we abandon the attempt to give a metaphysical argument for the intuition under discussion and instead justify it on broadly theoretical grounds. But if this really is the best we can do then there are ramifications: in particular, I think we are forced to admit that there is no justification for the claim that the intuition is necessarily true. The status I am according to the intuition is like that enjoyed by Ockham's razor: we should accept it because if it is true the theories we arrive at give a better explanation of the phenomena to be explained, and hence are more likely to be true. But such principles of theory-choice don't appear necessary; it's not as if the world is necessarily such that the simplest explanation is the right one – we just hope that our world is. Relying on these principles could have taken us badly wrong, but we live in hope that they don't in fact do so. I've offered a reason to believe in the *truth* of the intuition against infinitely descending chains of ontological priority, but I can think of no reason to believe in its *necessity*.

So it may be a contingent fact about our world that there are no infinitely descending chains of ontological dependence, which means we must be careful when deploying the principle. Consider again the Leibniz/Schaffer argument that if gunk is possible then the whole cannot be ontologically dependent on the parts (which led Leibniz to deny the possibility of gunk and Schaffer to accept priority monism). This argument relies on the necessity of the intuition under discussion, not simply its truth, and so I think it should be rejected. Sure, if gunk is possible, and if the whole is dependent on the parts, then there is a possible world in which dependence never bottoms out in fundamentality. But we've got no reason to rule out such worlds – at least, none that I can see. We have reason to think that our world isn't like that; but that only lets us conclude that, as a matter of fact, either the world isn't gunky or the whole is not dependent on the parts. So there is no pressure to reject either the possibility of gunk or the dependence of wholes on parts. We can hold both; from accepting the dependence of wholes on parts there is pressure only to reject the *actuality* of gunk, not its possibility. (We would be able to resuscitate the Leibniz/Schaffer argument if we had the premise that if it's possible for there to be gunk then there is actually gunk. It would follow (at least in the B system of modal logic) from this claim that if it's true that there's gunk then it's necessarily true; but I see no reason to think that claims like this are true. The facts concerning when composition and decomposition occurs, I have argued elsewhere<sup>15</sup>, may be contingent.) This is still an important result, however, and may still push us towards priority monism. For it is epistemically possible that the world is actually gunky – physicists might provide us with reason to believe this any day – and so we shouldn't rule out the claim that the world is this way. Since the *truth* of the claim that the whole is dependent on the parts, together with the *truth* of the intuition against infinite descent in metaphysical explanation,

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<sup>15</sup> Cameron (forthcoming)

rule out the truth of the world being gunky, this may push us towards accepting the *truth* of priority monism (if not its necessity, which is what Schaffer argues for<sup>16</sup>).

Other consequences for the contingency of the principle are: (1) even if the Leibnizian cosmological argument works in establishing the existence of God as the grounding for all being, it does nothing to establish that God's existence is necessary, and (2) while we have an argument that not *everything* is a mind-dependent entity, we have no reason to rule out the possibility of a world where everything is mind-dependent.

## 6: Conclusion

We've seen some important consequences of the intuition that there cannot be an infinite series of entities  $e_1, e_2, e_3, \dots$  such that  $e_1$  is ontologically dependent on  $e_2$ , and  $e_2$  ontologically dependent on  $e_3$  etc. I looked at some arguments for that intuition and found them wanting. I concluded that the best reason to believe it is that theories that don't violate it are theoretically beneficial. This justification leaves it open that the intuition is a merely contingent truth, in which case we should be more careful about how we apply it. I'll end on the following moral: we metaphysicians must be more attentive to the reasons for believing in the metaphysical claims we rely on; we may only have reason to accept the truth of such principles, not their necessity, in which case we must be careful to rely on such principles only to tell us about how the world *is*, not how it must have been.

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<sup>16</sup> Schaffer needs priority monism to be true if his account of truthmaking is to work (manuscript b). He says that, necessarily, the truthmaker for every true proposition is the world itself, and that's only acceptable if it's necessary that the world is the unique fundamental entity. However, just because the Leibniz/Schaffer argument only establishes the truth (if anything) of priority monism, this does not mean that no good argument can be given for its necessity. Its truth, together with the fact that if it is necessary then it helps us with truthmaking, may give us good reason to accept priority monism as a necessary truth.

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