The Grounding Conception of Governance

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Abstract

According to the governing conception of the laws of nature, laws, in some sense, determine concrete goings-on. Just how to understand the sort of determination at play in governance is, however, a substantial question. One potential answer to this question, which has recently received some attention, is that laws govern by grounding what happens in the concrete world. If this account succeeded, it would show that governance can be understood in terms of an independently motivated and widely accepted notion. Thus far, though, the grounding conception of governance has not been developed or evaluated in detail. In this paper, I fill this gap by mapping out and evaluating various possible ways of developing this conception of governance. My main conclusion is that the grounding conception runs into serious difficulties in trying to capture the key idea that governing laws determine the distribution of fundamental property instances.

1 Introduction

According to the governing conception of the laws of nature, laws are not merely descriptions or summaries of concrete goings-on but rather, in some significant sense, "govern" the concrete world. An important task in making sense of this conception of laws is to give a clear account of what the relevant sort of governance amounts to.[1] One approach to this task, which a number of authors have

[1] See Wilsch (2021), Shumener (2022) and Emery (2023: Sect. 6) for recent work on this issue.

recently considered (Rosen 2010: 120; Wilsch 2021: Sect. 15; Emery 2023: Sect. 6), [2] is to attempt to account for governance in terms of metaphysical ground.

While Wilsch and Emery raise some concerns over this sort of account, they do not claim that these concerns are decisive. Indeed, Wilsch (2021: 928) thinks that "ground-based accounts are the main competition" to his own account of governance. In significant respects, a ground-based account of governance also looks attractive. The claim that laws govern is generally intended to imply that laws determine, and thereby explain, concrete goings-on. Ground appears to provide an independently motivated and widely accepted way to make sense of these determinative and explanatory features of governance.

Despite their initial attractions, ground-based accounts have thus far not been developed or evaluated in detail. Here I fill this gap by developing and evaluating these accounts in greater detail than has been done thus far. The outcome of this close examination is not positive for ground-based accounts, as I ultimately argue that they run into serious difficulties in making sense of how governing laws can perform an important part of their theoretical work. Specifically, I argue that, given the grounding conception of governance, it is hard to see how governing laws could determine and explain the distribution of fundamental property instances.

This conclusion indicates that the grounding conception of governance, despite its initial appeal, runs into significant problems. I do not claim that these difficulties are necessarily fatal for the view. Indeed, part of my aim in the paper is to map out the potential options and challenges for any attempt to defend the grounding view. Nonetheless, I do think my argument provides significant

[2] Also relevant here are Bhogal (2017) and Emery (2019). Bhogal (2017: 454) proposes a non-standard view on which fundamental laws are ungrounded regularities that ground their instances, and claims that this position is reasonably viewed as a kind of governing account. Emery (2019) argues that laws ground their instances without taking up the question whether governance ought to be understood in terms of ground.

initial reason to doubt that the grounding conception can provide an adequate account of governance and, so, to look elsewhere for such an account.

In the next section, I develop two grounding accounts of governance that differ over whether laws ground regularities via grounding their instances or ground their instances via grounding regularities. In section 3, though, I argue that both approaches run into serious problems in making sense of how laws determine and explain the distribution of fundamental property instances. In sections 4 and 5, I argue that this problem cannot be avoided either by giving an alternative account of how laws ground their instances or by claiming that laws only ground regularities and not their instances. I conclude that ground looks ill-suited to provide an account of governance.

Before moving on to the main argument, I need to say something about how I understand ground. While my goal here is to rely only on claims about ground that are supported by a significant consensus, I make a few assumptions that are worth noting. Firstly, because governing laws are supposed to determine concrete goings-on, I work with the view that ground is a relation of metaphysical determination (Schaffer 2009) that backs metaphysical explanations rather than being itself an explanatory relation (Fine 2012). Secondly, for ease of exposition, I adopt the view that entities of different ontological categories can enter into the grounding relation (Schaffer 2009) rather than a view on which ground only involves facts (Rosen 2010). I see no reason, though, that my argument could not be re-cast in terms of fact-grounding. Finally, I assume that ground is a strict partial order and, so, is irreflexive, asymmetric and transitive. While this view has been questioned, it is part of the mainstream consensus concerning ground and it would be bad news for grounding accounts of governance if they could succeed only by denying it.

2 Developing the Grounding Account

Following Schaffer (2016), I will use "*Law* [$\forall x(Fx \rightarrow Gx)$]" to represent a governing law that determines and explains the regularity $\forall x(Fx \rightarrow Gx)$. I do not, however, intend for this representation to be indicative of the actual nature of governing laws. Instead, I intend it simply as a

useful shorthand for "the law that governs the regularity ∀x(Fx → Gx)", whatever the metaphysical structure of such a law. In general, I intend to remain neutral regarding competing accounts of the metaphysical nature or structure of governing laws. The target of my discussion is the governing conception of laws, in general, rather than some specific conception of governing laws, such as a primitivist view (Carroll 1994; Maudlin 2007) or the DTA view (Dretske 1977; Tooley 1977; Armstrong 1983).

As just indicated, though, I do assume, at least as a starting point, that governing laws determine, and thereby explain, universal generalisations concerning concrete matters of fact. I also start out with the assumption that governing laws determine and explain the particular concrete matters of fact that constitute these universal generalisations. I take it that the standard conception of governing laws in the literature involves these commitments.[3] Consequently, in considering whether governance can be understood in terms of ground, I begin with a conception of governance that involves these commitments.

Of course, actual governing laws would determine universal generalizations that are significantly more complex than the simple schema ∀x(Fx → Gx). One significant complication is that these generalizations would involve quantitative properties and relations. I take no stance here on the right metaphysical account, and relatedly the right formalization, of such properties and relations. Even without these details, though, I think we can have a relatively clear grasp on the kind of universal generalizations in question. For instance, assuming that Coulomb's law is a governing law, it would determine the universal generalization that, for any two point charges, the electrostatic

[3] See Beebee (2000: 578), Loewer (2012: 118) and Bhogal (2017: 454) for the idea that governing laws determine particular matters of fact and Schaffer (2016) and Hildebrand (2019: 176) for the idea that they determine regularities.

force between them is directly proportional to the product of the magnitude of the charges, and inversely proportional to the square of the distance between them.

To sum up, my core starting assumption about governing laws is that they determine and explain both universal generalizations about concrete matters of fact and the instances of those generalizations. Given this assumption, the natural way to develop the grounding account of governance is as the idea that laws ground both their instances and the nomic regularities constituted by those instances. There are, however, two importantly different ways to develop this idea, depending on whether laws immediately ground their instances or immediately ground nomic regularities. I begin with the first of these approaches.

A standard way to understand the claim that laws explain their instances is as the claim that the combination of the law and some event or state of affairs explains some other event or state of affairs (See, for example, Loewer 2012: 131; Marshall 2015: Sect. 3). For instance, Newton's second law together with the application of some net force on an object with a particular mass explains the object's acceleration. Similarly, Coulomb's law together with two objects having a particular charge and being a certain distance apart explains the electrostatic force that those objects exert on each other. On this understanding, then, for a law to explain its instances, is for the law together with an "input" event or state of affairs to explain an "output" event or state of affairs.

Putting this account of how laws explain their instances together with the idea that laws immediately ground their instances produces a view on which laws together with input states of affairs ground output states of affairs:

(*Instance-first instance grounding*) (*Law* [$\forall x(Fx \rightarrow Gx)$], Fa) *grounds* Ga[4]

[4] I do not think that an account quite like this has been considered in the literature. While Emery (2019) considers the idea that laws ground their instances, she gives a different account of what this involves.

Given that this schema holds for any arbitrary F, the combination of the law with each F grounds that F's being G. In this way, the law grounds each of its instances.

To get the further result that the law grounds the regularity ∀x(Fx → Gx), we can begin with Fine's (2012: 62) influential account of the grounds of universal generalizations. Following Marshall (2015: 3161), I refer to this account as "*Fine's principle*". According to *Fine's principle*, universal generalizations are jointly grounded in their instances and in a totality state of affairs concerning which objects there are. So, ∀x(Fx → Gx) is jointly grounded in (¬Fa_1 v Ga_1, ¬Fa_2 v Ga_2, …) and the totality state of affairs T(a_1, a_2, …), which says that a_1, a_2, … are all the objects there are.

With *Fine's principle* in place, we can note that, on the standard account of the grounds of disjunctions, Ga grounds ¬Fa v Ga. Given the transitivity of ground, it follows from *Instance-first instance grounding* that each disjunction in (¬Fa_1 v Ga_1, ¬Fa_2 v Ga_1, …) that involves an object that is, in fact, F is grounded in *Law* [∀x(Fx → Gx)]. Putting this together with *Fine's principle*, we get the result we are after:

(*Regularity grounding*) *Law* [∀x(Fx → Gx)] *grounds* ∀x(Fx → Gx)

Of course, the grounding in *Regularity grounding* is only partial, as the law only partially grounds (¬Fa_1 v Ga_1, ¬Fa_2 v Ga_1,…) – both because it only grounds some of the disjunctions in this state of affairs and because it does so only in combination with input states of affairs – and (¬Fa_1 v Ga_1, ¬Fa_2 v Ga_1, ¬Fa_3 v Ga_3,…) only partially grounds ∀x(Fx → Gx). This, however, is the right result. Firstly, it seems right that the law only grounds the disjunctions in (¬Fa_1 v Ga_1, ¬Fa_2 v Ga_1, …) that involve Fs, as the law appears to be irrelevant to cases where an object is not F. Secondly, it also seems right that the law enters the grounds of a regularity just by playing a role in grounding the instances of the regularity and not via the totality fact. So, *Instance-first instance grounding* provides not only an account of how laws ground their instances but also a seemingly plausible account of their role in grounding regularities.

Now, consider an alternative view on which the grounding in *Regularity grounding* is immediate and, so, laws immediately ground regularities (Rosen 2010: 120; Marshall 2015: 3162–3163). On this approach, the challenge is to get from *Regularity grounding* to the result that the law grounds its instances. To do so, the obvious move is to combine *Regularity grounding* with:

Regularity-first instance grounding (∀x(Fx → Gx), Fa) *grounds* Ga[5]

Given that this schema holds for any arbitrary F, ∀x(Fx → Gx) would partially ground each Fs being G. Given *Regularity-first instance grounding* and the transitivity of ground, it also follows that *Law* [∀x(Fx → Gx)] partially grounds each Fs being G. The law would, then, ground both its instances and the regularity ∀x(Fx → Gx).

A key difference between *Regularity-first instance grounding* and *Instance-first instance grounding* is that, while the latter relies on *Fine's principle* to get to *Regularity grounding*, the former is inconsistent with *Fine's principle* (Marshall 2015: Sect. 4; Bhogal 2017). *Regularity-first instance grounding* entails that ∀x(Fx → Gx) is a partial ground for (¬Fa_1 v Ga_1, ¬Fa_2 v Ga_1, …), which, together with the irreflexivity of ground, means that ∀x(Fx → Gx) cannot be grounded in (¬Fa_1 v Ga_1, ¬Fa_2 v Ga_1, …). So, *Regularity-first instance grounding* entails, contra *Fine's principle*, that universal generalizations are, at least in some cases, not grounded in their instances.

In similar contexts, both Bhogal (2017: 455) and Marshall (2015: Sect. 4) have argued that, while there is a cost attached to giving up *Fine's principle*, this cost is worth paying for an attractive account of laws in terms of ground. With *Instance-first instance grounding* on the table, though, we

[5] Bhogal (2017) proposes this sort of view but, on his approach, it is combined with the idea that the regularity is ungrounded and identical with the law. I take this position to be incompatible with the governing conception of laws, because it does not allow laws to determine and explain nomic regularities. Marshall (2015: 3162–3163), though, discusses an idea along these lines that is explicitly meant to be paired with the idea that laws ground regularities.

have an approach that appears to share the benefits of *Regularity-first instance grounding* while avoiding the cost. So, even if the cost is not necessarily prohibitive, it does give *Instance-first instance grounding* an important advantage over *Regularity-first instance grounding*.

3 A Problem for the Grounding Account

I have just distinguished between two grounding accounts of governance based on whether laws immediately ground regularities or their instances, and I argued that the latter approach has an initial advantage over the former. Despite their differences, though, the two approaches both entail that governance involves input states of affairs partially grounding output states of affairs. I am going to argue now that this shared commitment means that both approaches run into a serious difficulty. I will introduce the difficulty by focusing on *Instance-first instance grounding* but later in the section I will make clear how it also applies to *Regularity-first instance grounding*.

3.1 The Problem

According to *Instance-first instance grounding*, whenever a law determines one of its instances, an input state of affairs together with the law grounds an output state of affairs:

(*Instance-first instance grounding*) (*Law* [∀x(Fx → Gx)], Fa) *grounds* Ga

Wilsch (2021: 929) objects to this sort of approach for having the "consequence that causes are partial grounds of their effects". Combining Newton's second law with *Instance-first instance grounding*, for instance, has the consequence that the law together with the application of some net force to an object with a particular mass grounds the object's acceleration. The application of net force to the object, though, is a cause of its acceleration and, so, applying *Instance-first instance grounding* to this case entails that a cause is a partial ground of its effect. According to Wilsch (*Ibid*.), this sort of result is problematic as "it conflates the contrast between causal and non-causal explanations and as it entails that the world grows less fundamental over time".

This objection depends on the idea that the inputs and outputs of laws are linked as cause and effect and that the input is always prior to the output. There are, however, well-known arguments that these causal and temporal assumptions do not hold at the fundamental level.[6] Moreover, it seems plausible that the proponent of governing laws need only posit *fundamental* governing laws. Given that higher-level property instances are grounded in lower-level property instances, higher-level property instances could be fully metaphysically determined by the combination of fundamental governing laws and the grounding relations between the fundamental and the non-fundamental. So, a proponent of the grounding conception could respond to Wilsch's objection by claiming that we only need fundamental laws and that Wilsch's objection does not hold for fundamental laws.

Nonetheless, I think there are other, more compelling grounds to reject *Instance-first instance grounding*'s implications for the relation between a law's inputs and outputs. A key difference between Humeans and non-Humeans concerns the metaphysical status of the overall distribution of fundamental property instances. Humeans take this distribution to be metaphysically basic rather than being metaphysically determined in any non-trivial way by something like the laws of nature. The resulting metaphysically basic distribution of fundamental property instances constitutes the famous "Humean mosaic".

Non-Humeans, on the other hand, hold that certain entities, such as the laws of nature, metaphysically determine the distribution of fundamental property instances. The motivation for this view is partly that it avoids the result that the orderly pattern in the distribution of fundamental property instances is a massive cosmic coincidence.[7] On the governing law approach, in particular, the idea is that, if laws determine the pattern of property instantiation, then the order and regularity

[6] Frisch (2020) provides an overview both of arguments that causation should be eliminated from "suitably fundamental theories of physics" and of potential responses to these arguments. Wüthrich (2019) gives a recent overview of considerations from physics that indicate that space and time are not fundamental.

[7] For a recent discussion of this motivation for non-Humeanism, see Bhogal (2020).

in that pattern need not simply be a coincidence. If the pattern is partly determined by *Law* [∀x(Fx → Gx)], then it is not simply a coincidence that every F in the pattern is also G.[8]

As indicated by Wilsch's objection, though, relations of ground are generally taken to track relations of relative fundamentality, such that if an entity, ϕ, at least partially grounds an entity, ψ, then ϕ is more fundamental than ψ. Combining this ground-fundamentality link with *Instance-first instance grounding* has the consequence that, whenever a law determines the fact that some object that is F is also G, it also entails that the object's being F is more fundamental than its being G. The law, then, cannot determine, or metaphysically explain, a pattern in the distribution of *fundamental* property instances in which every F is G. Instead, the law can only explain *inter-level* patterns in which lower-level instances of F are accompanied by higher-level instances of G. The consequence is that governing laws cannot do a core part of their theoretical work, as they cannot determine or metaphysically explain orderly patterns in the fundamental property instances.

Importantly, *Regularity-first instance grounding* runs into the same problem. According to *Regularity-first instance grounding*, ∀x(Fx → Gx) together with Fa *grounds* Ga. So, *Regularity-first instance grounding*, no less than *Instance-first instance grounding*, has the implication that a law's input always grounds its output and, so, is always more fundamental than the output. Consequently, it again follows that laws can only determine inter-level patterns of property instantiation and not patterns at the fundamental level. So, the problem just raised for *Instance-first instance grounding* is equally a problem for *Regularity-first instance grounding*.

Both instance-grounding views developed in the previous section, then, run into a structural problem. Given a widely accepted idea concerning ground, both approaches entail that laws of nature always induce a hierarchical relation of relative fundamentality between their inputs and outputs. This result, though, means that governing laws cannot perform a key part of their

[8] Hildebrand (2013) argues that only some kinds of governing laws can do the requisite work here.

theoretical work by determining regular patterns in the distribution of fundamental property instances. So, the problem is that combining either of the instance-grounding views with a widely accepted idea concerning ground entails that nomic determination is always inter-level, while governing laws are supposed to determine patterns of property instantiation at a single level.

In trying to respond to this problem, proponents of the instance-grounding views have two options. Either they can simply accept that a law's inputs are always more fundamental than its outputs, or they can re-think the ground-fundamentality link. I doubt that proponents of governing laws would be interested in taking the first option. This option not only requires rejecting the common idea that the world includes a domain of fundamental, law-governed property instances, but actually entails that such a domain is *impossible*. So, taking this option requires adopting a highly revisionary approach to a standard metaphysical picture of the world.

The approach also opens up the possibility that some physical states of affairs that do not differ intrinsically from fundamental states of affairs may come out not very fundamental at all. Given that every time a law "produces" an output the output is grounded in the input, a physical state that comes later in the order of nomic production may be separated from the fundamental level by very many grounding steps. As I discuss further below, one important approach to relative fundamentality measures an entity's relative fundamentality by the number of grounding steps between it and the fundamental level. So, in the case just contemplated, the later physical state would come out not very fundamental at all. This consequence would also cause difficulties for the widespread idea that reality has a hierarchy where physical facts are more fundamental than chemical facts, which are more fundamental than biological facts, and so on. For instance, there is no guarantee that there would always be fewer grounding steps between the fundamental level and some physical state than there would be between the fundamental level and a chemical, biological or psychological state.

The problems just outlined indicate that, from the point of view of standard metaphysical commitments, accepting that a law's inputs are always more fundamental than its outputs leads to a confusion between relations of nomic determination and relations of relative fundamentality. As a result, the idea is inconsistent with standard metaphysical commitments, and developing it would require adopting a highly revisionary metaphysical picture. While I have not tried to show that it would be impossible for such a revisionary project to work, to adapt Lewis's (1983: 348) verdict on nominalism about natural properties, I doubt the game would be worth the candle.

3.2 Ground and Relative Fundamentality

The remaining option is to deny the ground-fundamentality link that generates the problem. Recall that, according to the link in question:

> If an entity, ϕ, at least partially grounds an entity, ψ, then ϕ is more fundamental than ψ.

Inspired by Werner (2021: 9734), we can call this principle *Upward*, as the core idea is that any relation of ground always moves one up the metaphysical hierarchy.[9]

As I mentioned above, *Upward* is often taken to be highly intuitive and is widely accepted.[10] Indeed, the principle has sometimes been taken to constitute a significant constraint on an acceptable general ground-theoretic account of relative fundamentality (Bennett: ch. 6; Werner 2021: 9734). It is also explicitly built into Karen Bennett's (2017: 157) influential account of relative fundamentality.

[9] Werner refers to the principle as "Upward*" and formulates it slightly differently.

[10] See, for instance, Rosen (2010: 116), Raven (2012: 689), Bennett (2017: 40, 143) and Werner (2021: 9734). Bennett's focus here, and in subsequent references to her, is on her notion of "building relations". Depending on how ground is understood, Bennet (2017: 12-13) takes it to be either equivalent to her notion of "building" or one among other building relations. Either way, her endorsement of *Upward* for building also extends to ground.

So, denying the principle would involve taking on a highly controversial commitment concerning the connection between ground and relative fundamentality.

Nonetheless, the literature on the connection between ground and relative fundamentality is still relatively underdeveloped, and there is plausibly scope for a proponent of one of the instance-grounding views to argue, or at least hope, that a clearer picture of this connection will undermine *Upward*. Denying that relations of ground in *some* way track relations of relative fundamentality would be a non-starter. A key part of the theoretical work performed by ground is to provide a layered or hierarchical account of reality, on which some parts of reality are more fundamental than, or ontologically prior to, others. Moreover, the core idea behind how ground performs this theoretical work is that, in some sense, the more fundamental grounds the less fundamental.[11] Nonetheless, it may ultimately turn out that the best way to capture this idea does not support *Upward*.

This thought might derive some support from a couple of recent proposals. As I mentioned above, the basic idea behind one recent approach to relative fundamentality is that x is more fundamental than y iff x is separated from the fundamental level by fewer relations of immediate ground than y.[12] A second idea is that, roughly, x is more fundamental than y iff x belongs to kind, *K*, and y belongs to

[11] See Werner (2021: Sect. 1) for a discussion of this idea's central role in the literature on ground.

[12] Bennett (2017: 156) claims that this condition is a sufficient but not a necessary condition for relations of relative fundamentality. However, Werner (2021) and Correia (2021a) have recently attempted to develop accounts on which this sort of condition is both necessary and sufficient. Their proposals are significantly more complicated than the simple idea described in the main text, but for present purposes the basic idea outlined here will suffice.

kind, K_1, and every member of K_1 is grounded in some member of K.[13] Both proposals provide potential ground-theoretic accounts of relative fundamentality that do not directly involve *Upward*.

In fact, both approaches appear to generate counterexamples to *Upward*. This point is clearest in the case of the kind-based account, as it seems quite possible for x to ground y, even if x and y do not belong to kinds, K and K_1, such that every member of K_1 is grounded in some member of K. To modify a case discussed by Bennett (2017: 159-160) and Shumener (2019: 307-309), consider a possible world where some minds are not grounded in physical states, while others are. In this case, even though a particular physical state grounds a particular mind, the physical state will not be more fundamental than the mind because physical states do not, in general, ground minds.

Matters are less clear for the other approach outlined above, because how it interacts with *Upward* depends on how one counts the grounding steps separating an entity from the fundamental level. Nonetheless, the way the approach has actually been developed does generate counterexamples to *Upward*, in cases where an entity has more than one full ground (Werner 2021: 9731; Correia 2021a: 5973). Existing versions of the approach, for instance, have the consequence that the relative fundamentality of a disjunctive fact that is independently fully grounded in both of its disjuncts is determined by the disjunct that is closest to the fundamental level. The consequence is that a disjunctive fact like [Electrons exist or Joe Biden is president of the USA] will only be slightly less fundamental than the fact [Electrons exist]. As a result, this disjunctive fact will be much more fundamental than [Joe Biden is president of the USA], even though it is fully grounded in the latter fact.

[13] As with the first idea, Bennett (2017: 160) builds this sort of condition into her overall account of relative fundamentality as a sufficient but not necessary condition for relations of relative fundamentality. Correia (2021b), however, has recently attempted to provide a complete analysis of relative fundamentality in terms of this idea. Both accounts are more complicated than the idea presented in the main text, but those details do not matter for present purposes.

The immediate consequence is that two recent ground-theoretic approaches to relative fundamentality not only account for relative fundamentality without explicit reference to *Upward*, but also generate counterexamples to it. Of course, one might think that the conflict between these accounts and *Upward* provides reason to reject the accounts rather than to reject *Upward*. Indeed, Bennett (2017: 151) rejects the sort of account discussed in the previous paragraph partly for this reason. In defending his version of the account, Werner (2021: 9734) also acknowledges that the conflict between *Upward* and the account might provide reason to reject the account. In response, he argues that the account is in line with the spirit, if not the letter, of *Upward*, because it entails that *Upward* only fails in cases where an entity has more than one full ground. In all other cases, the account still delivers the verdict that an entity is less fundamental than all of its partial grounds. In this way, he claims that the account still respects the key thought that "grounding always moves one up the metaphysical hierarchy".

Importantly, Werner's weakened principle, that *Upward* holds except in cases of grounding overdetermination, still seems to generate the same problem for the two instance-grounding views. I cannot think of any plausible metaphysical picture on which, every time a law governs one of its instances, the output also has an independent full ground. Any such view would also seem to make the governing role of laws redundant. If laws govern by grounding their instances but their instances always have independent full grounds, then it does not seem that there is any remaining work for governing laws to do.[14] So, even if one thinks that the view that an entity's relative fundamentality is measured by its distance from the fundamental level provides reason to re-think *Upward*, it still seems to generate a closely related principle that leads to the same problem for the instance-grounding views.

[14] Wilsch (2021: 929) raises this sort of concern about a different version of the grounding conception of governance.

The kind-based account, on the other hand, conflicts more deeply with *Upward*. As Shumener (2019: 310-312) emphasises, understanding relative fundamentality in terms of kinds makes the relative fundamentality of x and y an external matter concerning how things stand not with x and y but rather with other members of their kinds. For that reason, this account always leaves open the possibility that x grounds y without x being more fundamental than y. The case, which I discussed above, of a world that includes both minds grounded in the physical and minds not grounded in the physical illustrates this point.

Shumener argues that the kind-based view is flawed precisely because it makes the relative fundamentality of x and y external to x and y.[15] At face value, it seems odd that the relative fundamentality of two entities depends on grounding connections between *other* entities of the same kind. Due to this seemingly odd commitment, the view also generates counterintuitive results in specific cases. In the case that I discussed earlier, it seems odd that a particular mind that is grounded in a physical state is not less fundamental than that physical state but would be if all other minds were grounded in physical states. This point is structurally equivalent to Shumener's (2019: 311) claim that, intuitively, whether a particular atom is more fundamental than a particular table ought to depend on facts about grounding relations involving *those* entities and not on facts about how *other* tables are grounded. Shumener's (2019: 312-314) conclusion that the kind-based account is apt for capturing generalized relative fundamentality, expressed in statements like "hydrogen atoms ground water molecules", rather than for capturing individual relations of relative fundamentality seems plausible to me.

Overall, then, I think denying *Upward* would come at a significant cost to a proponent of one of the instance-grounding views. The principle remains widely accepted, to the extent that consistency

[15] Shumener's target is Bennett's use of the kind-based condition in her overall account of relative fundamentality, but her discussion also applies to attempts to use the kind-based approach to fully account for relative fundamentality.

with it is sometimes taken to be a constraint on an adequate ground-theoretic account of relative fundamentality. Although recent proposals for ground-theoretic accounts of relative fundamentality conflict with *Upward*, it seems unlikely that this result is of much help to the instance-grounding views. While one proposal appears to be consistent with the spirit of *Upward* in a way that generates the same difficulty for instance-grounding views, the other seems flawed in a way that is tied to its denial of the principle. So, if anything, it seems to me that considering these views provides some reason to think that a plausible general ground-theoretic account of relative fundamentality might be expected to vindicate a version of the ground-fundamentality link that is strong enough to generate the problem for the instance-grounding views.

Consequently, while I cannot rule out the possibility that further developments in the literature will ultimately undermine *Upward* and closely related principles, as things currently stand, the fact that the plausibility of the instance-grounding views depends on rejecting these kinds of principles is a bad result for these views. It leaves the views with a highly controversial commitment concerning the connection between ground and relative fundamentality, and leaves them hostage to the hope that further work on relative fundamentality will vindicate this commitment. In the remainder of the paper, I consider the prospects for developing a version of the grounding conception of governance that does not involve this problematic commitment.

4 Re-thinking Instance Grounding?

The problem just raised for the two grounding accounts of governance developed in section 2 stems from a couple of shared features of these accounts. Firstly, they both combine the grounding account of governance with the claim that laws govern their instances, and, secondly, they both adopt the "input-output" account of how laws govern their instances. For the grounding conception of governance to get around the problem raised in the previous section, then, it seems necessary to give up either the idea that laws govern their instances, or the input-output account of how they govern their instances. In the next section, I consider the former option. First, though, in this section,

I consider the possibility of combining the grounding account with what I take to be the clearest alternatives to the input-output account of how laws govern their instances. Each of the three sub-sections below is devoted to one such alternative.

4.1 The Disjunctive Account

One alternative to the input-output account that can be quickly ruled out is that *Law* [∀x(Fx → Gx)] fully and immediately grounds instances of G. Coulomb's law does not, on its own, explain the force between two objects, nor does Newton's second law, on its own, explain an object's acceleration. Instead, the laws only provide these sorts of explanations in combination with, or given, certain other particular matters of fact. One reason that the input-output account is common in discussions of how laws explain their instances is that it captures this point. If *Law* [∀x(Fx → Gx)] together with Fa determines Ga, then we have an explanation for why Ga, *given that* Fa.

There is, however, another way to capture this idea that also allows *Law* [∀x(Fx → Gx)] to ground the instances of ∀x(Fx → Gx). On this approach, laws ground conditional or disjunctive states of affairs:

(*Disjunctive instance grounding*) *Law* [∀x(Fx → Gx)] *grounds* ¬Fa v Ga

As with the previous proposals, this schema would have to hold for any arbitrary object or, at least, for any arbitrary F. The idea could then be developed by claiming either that laws immediately ground disjunctions or that they ground disjunctions via immediately grounding regularities. Either way, though, this approach still runs into the same sort of problem that I raised in the previous section.

Assume that F and G are fundamental properties. Given that ∀x(Fx → Gx) is a nomic regularity, the distribution of instances of F and G will involve the kind of orderly pattern that the proponent of governing laws thinks must be determined by the laws. So, to do the necessary work in determining orderly patterns in the distribution of fundamental property instances, *Law* [∀x(Fx → Gx)] would have to determine the pattern in the instances of Fs and Gs. In itself, though, *Disjunctive instance*

grounding allows the law only to ground disjunctions concerning the instances of Fs and Gs and not the instances of Fs and Gs themselves. Moreover, the only apparent way to get from *Disjunctive instance grounding* to the conclusion that *Law* [∀x(Fx → Gx)] grounds these instances would be to claim that the law grounds the instances via grounding the disjunctions.

This claim, though, seems entirely implausible. In the first place, together with the irreflexivity of ground, the claim would require rejecting the standard view that disjunctions are grounded in their disjuncts. If ¬Fa v Ga grounds Ga, then the irreflexivity of ground means that, contra the general consensus on the grounds of disjunctions, Ga cannot ground ¬Fa v Ga. Secondly, disjunctions underdetermine their disjuncts, in the sense that ¬Fa v Ga does not determine that either a is not F or a is G. So, it is obscure how a disjunction could ground and, so, determine any of its disjuncts.

Disjunctive instance grounding, then, only allows laws to determine disjunctions about fundamental property instances and does not enable them to determine the actual distribution of fundamental property instances. Consequently, *Disjunctive instance grounding* does not provide a way around the difficulty that I raised in the previous section for the input-output approaches, as laws remain incapable of governing the distribution of fundamental property instances.

Before moving on, it is worth mentioning a different possible way to develop the idea that laws govern by grounding disjunctions. Chen and Goldstein (2022), Adlam (2022) and Meacham (2023; forthcoming) have recently proposed that laws govern by *constraining* rather than determining the way that the world is. A potential way to develop this proposal is via the idea that the laws ground a massive disjunctive fact in which each disjunct is a physically possible way for the world to be. This disjunctive fact would then act as a constraint on the way the world can be without determining the particular way that the world actually is.[16]

[16] Thanks to an anonymous referee for bringing up this possibility.

The constraining conception of governance is still in its very early stages of development and, so, it is hard to reach a clear conclusion about its prospects. Consequently, I am not going to consider this proposal in much detail, and I will keep my primary focus on standard accounts of governance on which laws determine the way that the world is.

Having said that, I do think that the proposal seems to fit poorly with the standard view on the grounding of disjunctions. Given the standard view, a disjunctive fact that has the actual world history as one of its disjuncts would be fully grounded in actual world history. It follows that, on the proposed approach, the disjunctive facts that are grounded in laws are always also independently grounded in the actual world history. This result seems problematic in a couple of ways. Firstly, as I mentioned in the previous section, if laws govern by grounding facts that always have distinct full grounds, it is not clear that there is any substantial work for governing laws to do. Secondly, it is not clear to me that the disjunctive fact could act as a metaphysical constraint on the way that the world is, if the way that the world is determines the disjunctive fact. So, I think the proposal just outlined runs into a significant initial difficulty.

4.2 Emery's Account

In the course of arguing that laws ground their instances, Nina Emery (2019) interprets the instances of laws as sequences of events. Emery provides a number of examples of these sorts of instances:

> An instance of Newton's second law is 'the event of applying a net force of 1 N to the rock at t_1 [was] followed by the rock traveling at a speed of 1 m/s at t_2' (Emery 2019: 1541).
>
> An instance of the ideal gas law is 'increasing the volume of the box containing some gas, while holding the temperature fixed, cause[d] the pressure to decrease' (Emery 2019: 1542).
>
> An instance of Newton's law of universal gravitation is 'increasing the mass of the satellite change[d] the gravitational force it experienced' (Emery 2019: 1542).

In each case the instance of the law is a sequence of events that incorporates both what an input-output approach would interpret as the law's "input" and its "output". So, on this approach, an instance of a law is not the output on its own but rather the sequence of events in which the input precedes or causes the output.

Combining this conception of laws' instances with the idea that laws ground their instances, we get the following sort of result:

> It is a law that *f = ma grounds* "the event of applying a net force of 1 N to the rock at t_1 [was] followed by the rock traveling at a speed of 1 m/s at t_2".

This account sidesteps the problem with the approaches to instance grounding discussed thus far. Because the entire sequence of events is fully grounded just in the law, there is no problem with the "input" state of affairs coming out more fundamental than the "output" states of affairs. Moreover, unlike *Disjunctive instance grounding*, the law does not merely ground disjunctive facts but rather concrete sequences of events. So, this approach seems capable of grounding individual sequences of events and, thereby, grounding patterns or regularities in those sequences.

Unfortunately, the approach runs into a serious problem. On the orthodox view, the full grounds for a state of affairs necessitates that state of affairs. However, its being a law that *f = ma* does not necessitate the sequence of events in which applying a net force of 1 N to a particular rock at t_1 is followed by that rock traveling at a speed of 1 m/s at t_2. After all, any possible world where it is a law that *f = ma*, but a net force of 1 N is not applied to the rock in question at t_1, is a world where the law obtains but the sequence of events does not. I take it that there are clearly many such possible worlds and, consequently, the law does not necessitate the sequence of events.

Emery (2023: 456-457) has recently argued that the orthodox view that grounds necessitate their groundees is problematic for the grounding conception of governance, because some laws of nature, including some of the best candidates for fundamental laws, are probabilistic rather than

deterministic. If one thinks that this objection indicates that any tenable version of the grounding conception needs to be combined with the non-standard view that grounds do not necessitate their groundees, then the above objection to Emery's view might seem misdirected. By relying on the principle that grounds necessitate their groundees, the objection would rely on a principle that is incompatible with the grounding conception of governance.

The objection, though, can be re-stated without relying on that principle. Even allowing that grounds do not always necessitate their groundees, we should still expect a deterministic law like $f = ma$ to govern by necessitating its instances. However, on Emery's account of how laws ground their instances, we do not get this result because, as noted above, there are many possible worlds where $f = ma$ is a law but at t_1 no force is applied to the rock in question. Similarly, probabilistic laws ought to govern by determining the probability of their instances occurring, but in general such laws will not on their own assign any particular probability to a sequence of events involving both their "output" and their "input". Instead, they will only assign a probability to a particular output, *given a particular input*.

So, while Emery's account avoids the problem with input-output approaches to instance-grounding, it runs into a serious problem of its own. The problem is that laws do not, in general, determine on their own, even in a probabilistic way, sequences of events involving both their "outputs" and their "inputs". Instead, they only determine an output, or the probability of an output, given some input.

4.3 The Holistic Account

The final view I want to consider is one on which fundamental laws together with the initial conditions ground the rest of world history.[17] This view, in effect, adopts the account of governance

[17] Thanks to two anonymous referees for proposing this possible view. One referee also suggested combining the view with Maudlin's conception of governing laws as FLOTEs, as well as the possibility of developing the view without the assumption that there was an initial condition. I discuss both proposals below.

given in *Instance-first instance grounding* but combines it with the view that the only input is the initial state of the universe, and the only output is the rest of world history. One way to flesh out this view is by appealing to Maudlin's (2007) conception of fundamental governing laws as fundamental laws of temporal evolution (FLOTEs). Given that the FLOTEs are deterministic, the initial conditions plus the fundamental laws determine the rest of world history. Given the grounding conception of governance, a natural way to understand this result is that the laws together with the initial conditions ground the rest of world history. So, the view might be thought to fit quite naturally with at least one influential account of governing laws.

While this approach does have the consequence that the initial conditions are more fundamental than the rest of world history, it allows that the rest of world history, and the states of affairs and events that make it up, are all on the same level of fundamentality. This result looks far less extreme than the result for the instance-grounding views discussed in section 3.1. The result that the initial conditions are more fundamental than the rest of world history is still metaphysically revisionary, but it might be thought to be ultimately tenable. After all, there does seem to be a significant metaphysical distinction between the initial conditions and the rest of world history. Moreover, this result avoids some of the more problematic results discussed in section 3.1, such as that some intuitively fundamental physical states might turn out to be very far from fundamental, or that some chemical or biological states might come out more fundamental than intuitively fundamental physical states. So, even if there is some bullet-biting involved in accepting that the initial conditions are more fundamental than the rest of world history, one might argue that the view is ultimately defensible.

As just outlined, this proposal depends on the controversial empirical assumption that there was an initial condition of the universe. This commitment, though, is not necessarily essential to the view. Even if the universe did not have an initial condition, it may be that some other state of the universe could play the role of the initial conditions in the proposal just outlined. To do so a state would have

to satisfy two conditions. Firstly, along with certain fundamental laws it would have to determine and explain the rest of world history and, secondly, it would have to be intuitively metaphysically special, such that it is plausible that this state is more fundamental than the rest of world history.

The requirement that any law-governed world would have to include such a state, though, seems objectionably strong. For instance, Carroll (2020) in describing a case discussed by Earman (1986: 100) and Lange (2000: 85-90) considers a possible world populated by "a lone particle traveling through otherwise empty space at a constant velocity of, say, one meter per second", where "it is a law that all bodies have velocity at one meter per second". If this world lacks an initial state, as seems possible, then this world does not seem to include any intuitively metaphysically special state that could ground the rest of world history. Perhaps one could come up with reasons to doubt the possibility of this case, but I doubt it would be possible to provide principled grounds to rule out all possible cases where laws govern without there being any candidate special state of the universe. In any case, I think it is a serious drawback that the proposed account saddles the proponent of governing laws with this commitment.

4.4 Summing Up

My goal in this section has not been to decisively demonstrate that no way of combining the grounding conception of governance with an alternative to the input-output account of how laws govern their instances can succeed. Instead, I have tried to show that the clearest alternatives all run into significant difficulties. So, proponents of the grounding conception who wish to pursue this route face a seemingly significant challenge. They must show either that one of the options canvassed here can get around the difficulties that I have raised for it, or that there exists some further alternative account that is more successful.

5 The Grounding Account without Instance Grounding

The remaining question is whether the grounding account of governance can be developed in a way that altogether avoids the idea that laws ground their instances. Such a view would have to provide an alternative account of how laws ground concrete goings-on. The only clear option that I see here is to claim that laws ground regularities without grounding instances of those regularities.[18] This approach might be combined with the view that laws explain their instances in some other way, or at least that they have some sort of significant explanatory relevance for their instances. For example, one might claim that laws ground nomic regularities and that the instances of laws are, in turn, explained by subsumption under nomic regularities.

This sort of view is very hard to make sense of, as it is difficult to understand what it would be for a law to determine a regularity without thereby determining any of the regularity's instances. How could a law make it the case that the nomic regularity that all Fs are Gs obtains without making it the case that any particular F is G? As we have already seen, one could argue either that a regularity grounds its instances or that it is grounded in its instances, but it is very hard to see how the grounds for a regularity could be entirely decoupled from the grounds for its instances.

Even if we can make sense of this idea, though, it is hard to see how the current approach could get around the central difficulty for grounding accounts of governance that I have raised thus far in this paper. The core problem has been that grounding accounts seem incapable of generating laws that can determine the distribution of fundamental property instances. The approach just proposed, though, simply gives up the idea that laws ground their instances. Consequently, it appears to straightforwardly accept that laws do not determine fundamental property instances and the orderly patterns in those instances. Even if *Law* [$\forall x(Fx \rightarrow Gx)$] does determine $\forall x(Fx \rightarrow Gx)$, it does not determine the fact that each particular instance of F is accompanied by an instance of G. Of course, it sounds odd to say that a law can determine the regularity without determining the pattern in the

[18] This approach is consistent with the position sketched by Rosen (2010: 120). Wilsch (2021: 929) says that he thinks this is the most promising version of the grounding account of governance.

instances of Fs and Gs, but this oddness is a consequence of the view under discussion and not of the objection to the view.

A potential response might be that the account still allows laws to play a role in explaining fundamental property instances. For instance, as I indicated above, one might attempt to explain these instances via subsumption under regularities that are grounded in laws. This approach, though, still does not enable laws to metaphysically determine fundamental property instances or the patterns in their distribution. Instead, it leaves in place the Humean mosaic consisting of a metaphysically basic, ungoverned distribution of fundamental property instances. As a result, it does not do the work that the non-Humean thinks is required to avoid the conclusion that the orderly patterns in that distribution are a massive coincidence.

The result, I think, is that the view outlined in this section is deeply unpromising. It takes on a highly costly commitment concerning the connection between universal generalizations and their instances and only delivers a weak account of governance that does not allow laws to govern fundamental property instances. This looks like a deal that proponents of governing laws would be well-advised to turn down.

6 Conclusion

Governing laws are supposed to determine concrete goings-on. According to the grounding conception of governance, laws do so by grounding concrete states of affairs or regularities. I have here mapped out different ways that this idea might be developed. I argued, though, that each approach runs into serious difficulties in making sense of how governing laws can determine patterns in the distribution of fundamental property instances. Consequently, it is hard to see how the grounding conception can enable governing laws to perform an important part of their theoretical work.

It remains possible, of course, that proponents of the grounding conception of governance will find a way around these difficulties. Indeed, as I noted in the introduction to the paper, I hope that part of the value of the paper consists in mapping out some of the key challenges and potential options for grounding theorists who are interested in taking up this challenge. However, I also think my argument here indicates that, at least at present, the outlook for the grounding conception of governance is not promising. Consequently, as things stand, proponents of governing laws have good reason to look toward non-ground-theoretic accounts for an adequate account of governance.[19]

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[19] See Wilsch (2021), Emery (2023: Sect. 6) and Shumener (2022) for recent attempts to provide non-ground-theoretic accounts of governance.

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