

Ground

Michael J. Raven

UNIVERSITY OF VICTORIA

ABSTRACT. This essay focuses on a recently prominent notion of (*metaphysical*) *ground* which is distinctive for how it links metaphysics to explanation. Ground is supposed to serve both as the common factor in diverse *in virtue of* questions as well as the structuring relation in the project of explaining how some phenomena are “built” from more fundamental phenomena. My aim is to provide an opinionated synopsis of *this* notion of ground without engaging with others. Ground, so understood, generally resists illumination by appeal to more familiar models of explanation. Nevertheless, its distinctive explanatory and metaphysical aspects guide us on characterizing its explanatory logic and its metaphysical features. Some issues concerning the meta-question of what (if anything) grounds ground are explored, as well as some recent skeptical challenges to ground.

1 OVERVIEW

Recent years have seen a rapid reawakening of interest in the metaphysics of fundamentality. Much of this interest has focused on metaphysical notions of *ground*, largely spearheaded by the landmark essays of [Fine \[2001\]](#), [Schaffer \[2009\]](#), and [Rosen \[2010\]](#).¹ But the question ‘What is ground?’ is ambiguous. The word ‘ground’ has been used to express notions as diverse as *entailment*, *supervenience*, *truthmaking*, *existential dependence*, *essential dependence*, *metaphysical*

¹ [Sider \[2011\]](#)’s notion of *structure* (which expands on [Lewis \[1999\]](#)’s notion of *carving nature at the joints*) has also been prominent. Proponents of structure and ground share enthusiasm for fundamental metaphysics. But engaging with the significant differences in their approaches would take us too far afield (see [Fine \[2013\]](#) and [Sider \[2013\]](#) for more).

explanation, identity, reduction, and more. It is debatable how these diverse relations interact and whether a common core unites them.

My focus will be on a recently prominent use of ‘ground’ distinctive for how it links metaphysics to explanation, and nothing I say is intended to challenge the propriety of others. My aim is to provide an opinionated synopsis of *this* notion of ground. While space requires a condensed discussion of some important issues or controversies (as well as the omission of others), I will refer to parts of the literature in which matters are more thoroughly discussed.²

The paper proceeds as follows. First, I identify the target notion of ground as the point of convergence reached from two approaches: first, as the common factor in diverse *in virtue of* questions and, second, as the structuring relation in the *building project* of explaining how some phenomena are “built” from more fundamental phenomena (§2). Attention to how ground is *expressed* provides for fruitful avenues of research, even if it does not replace direct investigation into the relation of ground underlying it (§3). Although we might wish to illuminate ground by appeal to more familiar models of explanation, none is fully satisfying (§4). What’s more, ground’s distinctive *link* between metaphysics and explanation is fraught (§5). Nevertheless, the explanatory and metaphysical aspects of ground can provide guidance on what its relata are as well as the explanatory logic and metaphysical characteristics it has (§6). Some issues concerning the meta-question of what (if anything) grounds ground are explored (§7). I conclude with a brief discussion of some skeptical challenges to ground (§8).

2 CONVERGING ON GROUND

The target notion of ground can be approached as the common factor in diverse questions asking *in virtue of* what some phenomenon holds

² Recent articles surveying the state of the art on ground include [Clark and Liggins \[2012\]](#), [Correia and Schnieder \[2012\]](#), and [Trogdon \[2013b\]](#).

and answered by stating their *grounds* if they have any or stating that they have none. These questions include:

- (1) Is the aesthetic value of John Cage's 4'33" dependent on the context in which it is produced or appreciated?
- (2) Did Stalin's authority or power derive from consent or coercion?
- (3) Was Terri Schiavo's personhood constituted by her psychology?
- (4) Is Kripke's pain accounted for by the firing of his C-fibers?
- (5) Is my knowing that $2+2=4$ nothing over and above my Gettier-safe justified true belief that $2+2=4$?
- (6) Did the Humean mosaic determine that the throwing of the rock caused the breaking of the window?
- (7) Do all turtles have shells in virtue of each turtle having a shell?
- (8) Did Europe's being at war in 1940 consist in nothing more than the myriad activities of Europeans?

These questions seem to be instances of generic questions such as:³

- (1*) Does the aesthetic value of an artwork depend on the context in which it is produced or appreciated?
- (2*) Does authority or power derive from consent or coercion?
- (3*) Is one's personhood constituted by their psychology?
- (4*) Is the phenomenal accounted for by the physical?
- (5*) Is knowledge nothing over and above Gettier-safe justified true belief?
- (6*) Is causality determined by the Humean mosaic?
- (7*) Do generalizations hold in virtue of their instances?
- (8*) Do groups and their activities consist in nothing more than the features and activities of their members?

³ It is a subtle, substantive question whether (1*)-(8*) are best understood as *universal generalizations* or whether they are to be understood differently (cf. [Fine \[2015\]](#)).

Despite the diversity of subject and scope, it is tempting to suppose that (1)-(8) and (1*)-(8*) are unified as questions of a common sort. They are questions of what *grounds* what.

The target notion of ground can also be approached as playing a role in the grand metaphysical project of explaining how some phenomena are “built” from more fundamental phenomena.⁴ This *building project* assumes a hierarchical edifice ordered from the more derivative to the more fundamental, down to the foundational level (if there is one) or else endlessly without foundations. With the edifice in place, we might wish to use it for various applications: e.g. to identify the real with the occupants of the foundational level, or to “measure” degrees of reality in terms of “distance” from a designated level. But however the edifice might be applied, having it on hand requires some relation to give it its structure. It is increasingly supposed that this relation is *ground*.

Although one might question whether the two approaches converge, recent enthusiasm about ground is perhaps best seen as relying on the working hypothesis that they do. First, not only do questions of ground guide research programs and elicit answers sustaining entire schools of thought, they might even impact urgent everyday concerns (e.g. (3)/(3*) might bear on legal, medical, and social policies about end-of-life care). Second, ground inherits much of its interest from its role in characterizing the building project, a key axis of dispute between metaphysicians pursuing it and deflationists eschewing it.

Ground, when converged on in this way, evidently has many historical antecedents. [Plato \[1997\]](#)’s *Euthyphro* had Socrates ask whether or not an act’s being pious is grounded in its being loved by the gods (cf. [Evans \[2012\]](#)); [Aristotle \[1984\]](#)’s science of being qua being sought primary substances to ground all else (cf. [Schaffer \[2009\]](#)); [Leibniz \[1989\]](#)’s principle of sufficient reason required every

⁴ The ‘building’ term is from [Bennett \[2011b\]](#), who subsumes ground with other relations (e.g. *composition*, *constitution*, *realization*, and *microbased determination*) under the general category of *building relations*. While I won’t assume that she and I have the same building project in mind, they are similar enough to warrant the common term.

truth to have an explanation with none being ungrounded (cf. [Della Rocca \[2012\]](#); [Dasgupta \[forthcoming\]](#)); and [Bolzano \[1837\]](#) anticipated recent interest in ground in developing a formal framework for it (cf. [Tatzel \[2002\]](#)).

Ground is thus supposed to serve a certain job description: it is the common factor in diverse *in virtue of* questions, the structuring relation in the project of explaining how some phenomena are “built” from more fundamental phenomena, and a key part of a venerable tradition concerned with metaphysical explanation. It might be debated whether this job can be served by any one notion, or even whether it is a job worth serving. But such debates require further clarifying what ground’s job is supposed to be. So let us explore *it*.

3 EXPRESSING GROUND

Since ground provides a kind of explanation, it might help to clarify it by contrasting two approaches to how explanations may be *expressed*. The *operator (connective) approach* uses an operator to join the sentences stating what *gets* explained to the sentences stating what *does* the explaining. The *relational (predicate) approach* uses a relational predicate to join the terms referring to what *gets* explained and the terms referring to what *does* the explaining.

On the operator approach, it has been customary to take a ground operator to join a *single* sentence with a *plurality* of sentences.⁵ Following [Fine \[2012a\]](#)’s notation, we use the operator ‘>’ to join a

⁵ We might introduce a *many-many* notion of ground which permits a *plurality* of sentences Φ to be grounded *en masse* in another plurality of sentences Γ . There is an interesting question, however, whether this many-many notion is *distributive* in [Fine \[2012a: 54\]](#)’s sense, where Γ *distributively grounds* Φ just in case there is a decomposition ϕ_1, ϕ_2, \dots of Φ (where $\Phi = \{\phi_1, \phi_2, \dots\}$) and a corresponding decomposition $\Gamma_1, \Gamma_2, \dots$ of Γ (where $\Gamma = \Gamma_1 \cup \Gamma_2 \cup \dots$) such that $\phi_1 > \Gamma_1, \phi_2 > \Gamma_2, \dots$. [Dasgupta \[2014\]](#) argues that some cases of many-many ground are not distributive. [Litland \[ms-c\]](#) explores the pure logic of many-many ground.

sentence ϕ with a plurality of sentences Γ so that ' $\phi \succ \Gamma$ ' states that Γ *fully grounds* ϕ (or, informally: ϕ because Γ).⁶

Just as we may distinguish between a full explanation from its contributing parts, so too we may distinguish *full* and *partial* grounds. Thus, for example, while both conjuncts of a conjunction together *fully* ground the conjunction, each only *partially* grounds (or *helps* ground) it. Following [Fine \[2012a\]](#) again, ' $\phi \succ \Gamma$ ' states that Γ *partially* grounds ϕ , where we may define a notion of partial ground in terms of full ground: $\phi \succ \Gamma$ iff there is a superset Γ^* of Γ such that $\phi \succ \Gamma^*$.

Perhaps the main benefit of the operator approach is that it postpones controversies immediately arising for the relational approach. The latter strongly suggests that ground is a *relation*, and so prompts us to engage with the controversies over what this relation is and what its relata are (§6). Even if we ultimately assert that ground is a relation, the operator approach at least temporarily permits neutrally disengaging from controversies relying on that assertion.

This neutrality helps us to focus on other topics, such as the logic and semantics of ground operators. Here we may distinguish between the *pure* and *impure* logic of ground. The *pure* logic concerns the structural principles governing the ground operators without regard to the internal features of what they connect. But the *impure* logic is additionally concerned with these internal features (e.g. logical form). Much of the research on the logic of ground has concerned both its pure and impure aspects ([Batchelor \[2010\]](#); [Bolzano \[1837\]](#); [Correia \[2010,2014\]](#); [Fine \[2010,2012a,2012b\]](#); [Mulligan, Simons, and Smith \[1984\]](#); [Rosen \[2010\]](#); [Schnieder \[2011\]](#); [Tatzel \[2002\]](#)), although some has focused on the pure ([Fine \[2012b\]](#); [deRosset \[2013b\]](#)). The topic is especially urgent in the light of various puzzles somewhat similar to the paradoxes of self-reference ([Fine \[2010\]](#); [Krämer \[2013\]](#)).

⁶ Allowing Γ to be empty allows for a notion of *zero-ground* distinct from *ungroundedness* ([Fine \[2012a\]](#)). [Litland \[ms-a\]](#) suggests an application of zero-ground to the meta-question of what grounds facts about what grounds what, and [Litland \[ms-c\]](#)'s exploration of many-many ground also allows for Φ to be empty.

However apt the operator approach's neutrality might be for certain topics, it seems inapt for others. For one, ground is almost irresistibly taken to be a relation if its role in the building project is emphasized. For another, explanations are often conceived as relations between what explains and what gets explained. Either way, we are drawn toward supposing ground to be a relation. If so, then our concerns do not ultimately lie with the manner in which this relation is expressed but rather with the relation itself. The controversies the operator approach postpones should eventually be addressed (§6).⁷

I will tend toward the operator approach when neutrality is apt and will focus on the relation of ground when the need arises.

4 MODELS FOR GROUND

However ground is best expressed, what is the nature of the distinctively metaphysical kind of explanation it provides? To answer this question, it is tempting to rely on more familiar kinds of explanation as models to illuminate (if not reduce or analyze) explanations of ground. But there appear to be limitations on the extent to which such models can be relied.

Causal explanation appears importantly disanalogous to explanations of ground.⁸ First, ground explanations needn't involve the traditional hallmarks of causal explanation, such as a transference of power, or a non-trivial statistical relationship, or even an asymmetric counterfactual dependence, between the explaining causes and the explained effects. For example, given that a conjunction is

⁷ Here there is an analogy with approaches to modality. On the modal operator approach, one focuses on sentential operators like 'It is possible that' without regard to their interpretation. On the modal relational approach, one interprets the operator in terms of a quantifier over possible worlds and a relational truth predicate indexed to those worlds.

⁸ But see especially [Schaffer \[2014\]](#), who adapts structural equation models to explore formal analogies between cause and ground. [Bennett \[2011b\]](#) is also tantalized by analogies between cause and ground.

grounded in its conjuncts, no power is transferred from either to the other, either is as likely to obtain as the other, and each would obtain were the other to obtain. Second, there can be ground explanations without causal explanations. For example, the question can intelligibly be raised which one of two necessary facts (e.g. a mathematical axiom and a theorem) outside the causal order might ground the other, even though there can be no causal explanation of the one by the other. For another example, the question of whether causality is grounded in the Humean mosaic (cf. (6)/(6*)) is not a question of *causal* explanation.

In light of these challenges to using causal explanation as a model, one might instead rely on various kinds of *non-causal explanations* for further models. One such kind is the family of *modal (supervenience) explanations* which explain a phenomenon by citing what *necessitates* it (or on what it *supervenes*). But necessitation (supervenience) alone does not provide a ground explanation since ground explanations are *hyperintensional* whereas modal explanations are not.⁹ For example, we might wish to allow that set-theoretic facts ground arithmetic facts although each necessitates (or supervenes on) the other.

Instead, we might look to *mathematical explanation*, which is often supposed to be both non-causal and hyperintensional. But here too analogies are strained. Mathematical proof is often taken to be central to mathematical explanation ([Hafner and Mancosu \[2005\]](#)), with some taking proof to be explanatory only if the proof proceeds from the essence of the entities it concerns ([Steiner \[1978\]](#)). But mathematical proof would seem neither necessary nor sufficient for ground. Unnecessary because, for example, we might wish to allow that the physical grounds the phenomenal even if not provably so. Insufficient because, for example, we might wish to allow one theorem

⁹ The once common impulse to eschew hyperintensionality in general now seems outmoded (cf. [Fine \[1994\]](#); [McLaughlin and Bennett \[2011\]](#); [Nolan \[2014\]](#)), and in any case does not present a *distinctive* challenge to ground as opposed to any other hyperintensional notion.

to ground another even though each has a proof from the other proceeding from the essence of the entities it concerns.

More sweepingly, it might be doubted whether any exclusively apriori or any exclusively aposteriori kind of explanation will be a good model. For it seems we wish to allow that what grounds what might turn on a mixture of apriori and aposteriori considerations. For example, if the physical grounds the biological, then that would presumably turn on such a mixture.¹⁰

Perhaps familiar kinds of explanation can help illuminate explanations of ground at least in circumscribed cases. But, in general, explanations of ground do not straightforwardly conform to these kinds of explanation, and it is unobvious whether there are other kinds to which they do. This helps explain why ground is often taken on its own terms as providing a *bona fide*, distinctively metaphysical kind of explanation.

5 LINKING METAPHYSICS TO EXPLANATION

Indeed, one of ground's distinctive hallmarks is how it links metaphysics to explanation. Somehow, ground is *metaphysical* because it concerns the phenomena in the world itself, but also *explanatory* because it concerns how some phenomena hold in virtue of others.

But these metaphysical and explanatory aspects seem to be in tension. On the one hand, it is supposed that metaphysics concerns phenomena in the world itself independently of the explanatory interests and goals of inquirers like us. On the other hand, it is supposed that explanations are sensitive to the explanatory interests and goals of inquirers like us. In light of this tension, how is the link to be understood?

Separatists separate ground from metaphysical explanation ([Audi \[2012b\]](#); [Correia and Schnieder \[2012\]](#); [Koslicki \[2012\]](#); [Schaffer](#)

¹⁰ This is controversial; cf. [Block and Stalnaker \[1999\]](#), [Chalmers and Jackson \[2001\]](#), and [Block \[2014\]](#).

[2012]; [Trogdon \[2013b\]](#)). This allows localizing the metaphysical aspect to ground and the explanatory aspect to metaphysical explanation while avoiding any troubles from either one possessing both aspects. Despite this separation, ground and metaphysical explanation are linked in that ground *backs* metaphysical explanation. This is analogous to the view that causal explanations are *backed by* causal relations. Thus, just as causal explanation can be a communicative act sensitive to our explanatory interests and goals which is backed by worldly causal relations, so too metaphysical explanation can be a communicative act sensitive to our explanatory interests and goals which is backed by worldly ground relations.

Unionists link ground to metaphysical explanation by taking ground *to be* (a kind of) metaphysical explanation ([Dasgupta \[2014\]](#); [Fine \[2012a\]](#); [Litland \[2013\]](#); [Raven \[2012\]](#); [Rosen \[2010\]](#)).¹¹ Somehow unionists need to reconcile the apparent tension between the metaphysical and explanatory aspects of ground. Here unionists might be inspired by a different analogy with cause and causal explanation (cf. [Strevens \[2008\]](#)). Just as *some* kind of worldly explanation is given merely by citing what causes what, unionists might also say that so too *some* kind of worldly explanation is given merely by citing what grounds what. Unionists might then concede that *this* kind of explanation of ground needn't satisfy just any of the explanatory interests or goals active in a given context without thereby undermining the legitimacy of the kind of explanation it *does* provide. If so, perhaps the burden is on the separatist to explain why ground itself provides *not even this* kind of explanation (whatever it is).

The debate between separatists and unionists appears to be entangled with profound questions concerning the link between metaphysics and explanation (more generally, epistemology). These questions have a long history. Aristotle struggled to maintain substances as both metaphysically and epistemically primary (cf. [Reeve \[2000\]](#)). Similar struggles are familiar from the history of philosophy

¹¹ We may allow many kinds of metaphysical explanation, so long as ground is or backs one such kind.

since then. But engaging with these struggles is beyond the scope of this essay.

6 BEYOND THE OPERATOR

As fraught as the debate between separatists and unionists might be, both would seem to have their reasons for taking ground to be a relation. It is unclear how separatists could take ground to back metaphysical explanation unless ground relates entities somehow involved or mentioned in the explanations it backs. And it is unclear how unionists could take ground to be metaphysical explanation unless ground relates what explains to what gets explained. Either way, it appears that clarifying ground requires going beyond the operator and back to the relation underlying it.

But remaining neutral on the debate between separatists and unionists would inhibit exploring interactions between this and other debates. To facilitate exploration, the rest of this section will assume unionism without argument and without prejudice against separatism. We may then illustrate how unionism bears on debates about the relata of ground (§6.1) as well as the explanatory logic and metaphysical characteristics of the relation of ground (§§6.2-6.3).

6.1 Facts

On the present view, ground is a relation of metaphysical explanation. We may then appeal to the explanatory aspect of ground to guide us on how to understand this relation. Since ground is an explanatory *relation*, its relata must be apt for explaining or being explained. This evidently disqualifies some otherwise tempting candidates (*pace* [Jenkins \[2011\]](#) and [Schaffer \[2009\]](#)).

Events are disqualified for being too concrete. For we wish to allow that a conjunction is explained by its conjuncts together even when those conjuncts are not, or do not report, events in any usual sense (e.g. they might be aspatial and atemporal logical facts about no objects in particular).

Objects are disqualified for being unable to give or receive explanations. The diamond *itself* does not explain its hardness. Rather, the diamond's ductility, plasticity, and so on, explain its hardness. Nor does the diamond *itself* get explained by carbon at a high temperature and pressure. Rather, the carbon's being at a high temperature and pressure explains the *existence* of the diamond.

Thus, in order for ground to be explanatory, its relata must concern *how* things are without prejudging whether they are concrete or abstract. This would seem to require the relata to be *facts* (cf. [Rosen \[2010\]](#); [Audi \[2012b\]](#)). Here a *fact* is the *state of reality* a true representation represents, not the *representation* of that state.¹² Facts, so understood, have structures and constituents (whether individuals or general features). Just what these structures and constituents might be will affect just how fine- or coarse-grained facts might be; but we needn't engage with that controversy here.¹³ Facts needn't be concrete and are apt for explaining or being explained (e.g. *that* everything is self-identical and *that* the diamond is hard together explain the conjunction *that* everything is self-identical and the diamond is hard). So facts are not disqualified like the other candidates were.

¹² Some (such as [Fine \[2005\]](#)) distinguish between *worldly* and *transcendental* sentences, where the truth of the former turns on the worldly (concrete?) circumstances whereas the truth of the latter does not. One might think that taking facts to be states of reality suggests identifying them with these worldly circumstances. But one reason to avoid this suggestion is that it would limit relations of ground just to these worldly circumstances. We might wish to allow for transcendental relations of ground (e.g. that the joint truth of two transcendental sentences, such as 'Socrates is essentially rational' and 'Socrates is essentially animal', grounds their conjunction). I will *not* assume that facts *qua* states of reality are to be identified with worldly circumstances.

¹³ [Fine \[2001\]](#) and [Rosen \[2010\]](#) suggest a fine-grained view of facts which distinguishes the fact that George is a bachelor from the fact that George is an unmarried male. [Audi \[2012b\]](#) criticizes this "conceptualist" view for corrupting the "worldliness" of these facts by distinguishing them in terms of our concepts of *bachelor* and *unmarried male*, and opts instead for a "worldly" view identifying these facts. [Raven \[2012\]](#) suggests that the "worldly/conceptual" divide is a red herring since one might insist that facts are worldly but fine-grained.

Ground thus appears to be a multigrade metaphysical explanatory relation between the facts which get explained (the *grounded*) and the facts which explain them (the *grounds*).

6.2 Explanatory Logic

Ground's *explanatory* aspect seems to impose on it a distinctive logic, including: (i) *irreflexivity*: just as nothing explains itself, so too nothing grounds itself; (ii) *asymmetry*: just as cyclical explanations are prohibited, so too are cycles of ground; (iii) *transitivity (cut)*: just as explanations chain, so too ground chains;¹⁴ (iv) *well-foundedness*: if explanations must begin, then so too any grounded fact must ultimately be grounded in facts which themselves are ungrounded; and (v) *non-monotonicity*: just as explanation needn't survive arbitrary additional premises, so too ground needn't survive arbitrary additional grounds. (i)-(iii) entail that ground forms a strict partial ordering on facts, like a hierarchy of chains of explanation, whereas (iv) entails that this ordering terminates in minimal elements, like an explanatory chain beginning from unexplained explainers.

Part of why ground is now the subject of study in its own right is the growing realization that the role it is supposed to perform cannot be performed by other notions, such as *entailment*, *supervenience*, *identity (reduction)*, or *truthmaking*. The explanatory logic of ground helps explain their inability to perform this role. *Entailment* is unable because it is reflexive: no ϕ grounds itself, and yet every ϕ entails ϕ . *Supervenience* is unable because it is not asymmetric: if ψ grounds ϕ then ϕ does not ground ψ , and yet if ϕ supervenes on ψ it still might be that ψ supervenes on ϕ . *Identity* (including kinds of *reduction* entailing identity) is unable because it is reflexive and symmetric. And *truthmaking* is unable because it does not chain: if ψ grounds ρ and ρ grounds ϕ , then ψ grounds ϕ , and yet truthmaking cannot chain in this way since its relata are not of the same sort (truths vs. things) ([Fine \[2012a\]](#)).

¹⁴ Strictly speaking, full ground ($>$) is not transitive because it is not a binary relation; but still it chains because it obeys a cut rule. On the other hand, partial ground (\succ) is a binary relation and indeed chains precisely because it is transitive.

But there are challenges to this explanatory logic of ground. [Jenkins \[2011\]](#) and [Correia \[2014\]](#) questions whether ground is irreflexive; but [Raven \[2013\]](#) defends irreflexivity. [Schaffer \(2012\)](#) and [Tahko \[2013\]](#) consider counterexamples to transitivity, with Schaffer taking them to support a contrastive approach to ground on analogy with contrastive approaches to causation; but [Litland \[2013\]](#), [Raven \[2013\]](#), and [Javier-Castellanos \[2014\]](#) defend transitivity. [Bliss \[2014\]](#) and [Barnes \[ms\]](#) consider whether ground must be asymmetric. [Rodriguez-Pereyra \[ms\]](#) argues against ground being a strict order. Well-foundedness is implicitly assumed if seldom explicitly defended (although see [Cameron \[2008\]](#) and [Schaffer \[forthcoming\]](#)), although [Rosen \[2010\]](#) and [Raven \[ms\]](#) leave well-foundedness open and [Bliss \[2013\]](#) and [Tahko \[2014\]](#) challenge it.

6.3 Metaphysical Characteristics

Ground's *metaphysical* aspect seems to impose on it distinctive metaphysical characteristics, including: (i) *necessity*: since grounds *determine* what they ground, the obtaining of the grounds necessitate what they ground; (ii) *internality*: since it is *internal* to the grounds and the grounded that they are so related, then it is necessary that the grounds ground the grounded if both obtain; and (iii) *essentiality*: when a relation of ground obtains then it does so in virtue of the natures of the (constituents of the) grounds, the grounded, or both.¹⁵

What's more, given certain assumptions, these characteristics might be a package deal. For suppose that an entity's essential features are both necessary and internal to it. Then, given essentiality, it might then be argued that necessity and internality also hold.¹⁶

But there are also challenges to each of these metaphysical characteristics. [Chudnoff \[ms\]](#), [Leuenberger \[2014\]](#), and [Skiles \[2015\]](#)

¹⁵ Here I am grouping together subtly different versions of essentiality varying over whether the natures involved concern the grounds, the grounded, both, or the constituents of the grounds, the grounded, or both (cf. [Fine \[2012a\]](#)). Although the differences matter, I won't be concerned with them here.

¹⁶ The relations between necessity, internality, and essentiality are underexplored; but see [Litland \[ms-b\]](#) for discussion.

argue against the necessity of ground; but [Trogon \[2013a\]](#) defends its necessity by appeal to its essentiality. [Litland \[ms-b\]](#) offers a proof that internality fails but goes on to sketch a sense in which it remains. [Audi \[2012b\]](#), [Bennett \[2011a\]](#), [Dasgupta \[2015\]](#), [Fine \[2012a\]](#), [Rosen \[2010\]](#), and [Trogon \[2013a\]](#) each treat essentiality sympathetically. But [Fine \[2012a\]](#) doubts ground can be analyzed in terms of essence whereas [Correia \[2013\]](#) is more optimistic. More recently, [Fine \[2015\]](#) defends a unified foundations for essence and ground. Additionally, essentiality might bear on the controversy over how to answer the meta-question of what (if anything) grounds ground (§7).

7 META-GROUND

Let a *ground-fact* be a fact about what grounds what. For example, the following ground-fact is a candidate answer to (8):

WAR>ACTS Europeans acting in myriad ways in 1940 [ACTS]
grounds Europe's being at war in 1940 [WAR].

Just as we may ask what (if anything) grounds a given fact, so too it would seem we may ask the *meta-question* of what (if anything) grounds a *ground-fact* (Raven [2009]; Sider [2011]; Bennett [2011a]; deRosset [2013a]; Dasgupta [2015]; Litland [ms-a]). But the meta-question raises a dilemma.

The first horn of the dilemma answers the meta-question negatively: ground-facts have no ground. But this conflicts with a desirable application of ground: to purge the non-fundamental. The idea is that something can be purged from fundamental reality if the facts about it are grounded in facts not about it. Thus, we might wish to purge wars from fundamental reality by establishing that all facts about wars are grounded in facts not about wars. But that would be to establish ground-facts relating facts about wars to facts not about wars. These ground-facts will themselves be about wars, since they will have relata about wars (viz. the facts about wars which get grounded in facts not about wars). So these ground-facts will need to be purged too. But they cannot be purged since they are ungrounded. So the attempted purge is a non-starter, and the desired application along with it.

The second horn of the dilemma answers the meta-question positively: ground-facts have grounds. But now the problem is to identify what the grounds of ground-facts might be in a way that does not give rise to a regress ([Raven \[2009\]](#); [Sider \[2011\]](#); [Bennett \[2011a\]](#)). For given that a ground-fact has these grounds, one might ask what, if anything, grounds the *further* ground-fact that it is so grounded. The dilemma arises anew.

Two broad strategies have emerged in the literature. Both accept the second horn: ground-facts have grounds. But they differ over what those grounds are.

The *reductionist* strategy says the grounds of a ground-fact reduce to the grounds embedded in the ground-fact ([Raven \[2009\]](#); [Bennett \[2011a\]](#); [deRosset \[2013a\]](#)). Thus, **WAR** > **ACTS** is grounded in **ACTS**: the myriad actions not only ground the war but also ground *their grounding* the war.

But a difficulty for reductionism is that it obscures any general picture of the account a ground-fact provides by omitting any sort of explanatory connection. To illustrate, suppose analogously that Europe's being at war in 1917 is *also* grounded in *different* myriad actions of Europeans. Despite the specific differences between the 1917 myriad and the 1940 myriad, each would seem to rely on a common but abstract explanatory connection between such "warring" myriad actions and war. But reductionism cannot account for this explanatory connection by including it among the ground-fact's grounds, and it is unclear how else to account for it.

The *connectivist* strategy says that a fact about such an explanatory connection helps ground the ground-fact ([Raven \[2009\]](#); [Rosen \[2010\]](#); [Fine \[2012a\]](#); [Dasgupta \[2015\]](#); [Litland \[ms-a\]](#)). Such an explanatory connection might derive from a connection between essence and ground. For example:

CONNECTIVE It lies in the nature of war that: if **ACTS**,
then **WAR**.

This connective fact helps ground **WAR>ACTS**: the myriad actions together with this explanatory connection grounds *their grounding* the war.

But a difficulty for connectivism is that the problem faced by the first horn arises again for connective facts. For example, war won't be excluded from fundamental reality if connective facts about war remain ungrounded. One reply would be to show how these connective facts are grounded. But it is unobvious what might ground them without vicious regress ([Audi \[2012b\]](#); [Bennett \[2011a\]](#)). Another reply is to treat these connective facts as somehow exceptional for neither having nor needing grounds ([Dasgupta \[2015\]](#)) or perhaps for being "zero-grounded": grounded in the null ground ([Litland \[ms-a\]](#)). But this invites the objection that the distinction between these exceptional connective facts and the rest is invidious ([deRosset \[2013a\]](#)).

Neither reductionism nor connectivism has yet been thoroughly explored. Nor have other strategies been seriously considered. The meta-question is ripe for future research.

8 SKEPTICAL CHALLENGES

A lot rests on ground: it is supposed to play a key role in formulating important philosophical questions and to help characterize one of metaphysics' central projects. But ground can seem unstable for its eyebrow-raising link between metaphysics and explanation, its shunning of familiar models, and its cagey stance on in virtue of what (if anything) it obtains. These considerations lead some to include ground in what [Hofweber \[2009: 267\]](#) calls *esoteric metaphysics*, according to which "one needs to understand distinctively metaphysical terms [such as 'ground'] in order for one to understand what the questions are that metaphysics tries to answer. You have to be an insider to get in the door."

Outsider skeptics are skeptical of ground because it is esoteric ([Hofweber \[2009\]](#); [Daly \[2012\]](#)). For them, 'esoteric' is not merely used as a descriptive term but also a term of abuse. They say ground is to

be rejected for being intolerably esoteric. They have not been invited to get in the door.

But while the intolerant cannot always be convinced to tolerate, [Rosen \[2010\]](#), [Audi \[2012a\]](#), [Fine \[2012a\]](#), and [Raven \[2012\]](#) argue that ground is not esoteric or, at least, is tolerably esoteric. The invitation is out: anyone may get in the door if they wish.

Insider skeptics don't mind esoteric metaphysics *per se* but doubt ground's contribution to it ([Koslicki \[forthcoming\]](#); [Wilson \[2014\]](#)). One insider objection is that ground is confused: controversies about ground (like those above) are leveraged into the charge that ground is a tangled mélange of fine-grained notions of dependence. Another insider objection is that ground is irrelevant: once these fine-grained notions of dependence are pried apart and taken on their own merits, there is no distinctive job left for ground. Insider skeptics got the invitation to get in the door but see no point in doing so.

But instead of prematurely taking these insider objections as reasons for halting further research on ground, one might instead repurpose them to encourage future research into disentangling ground from neighboring ground-like notions and in bolstering its job description.

Disentanglement might proceed by granting that ground has such-and-such features because they are imposed by its explanatory or metaphysical aspect (§6) while granting that *other* notions of ground have different features (cf. [Raven \[2013\]](#)). One might worry that this would make ground less interesting by treating it too much like a stipulated notion. But perhaps interest in ground could be reinforced by emphasizing how its package of explanatory and metaphysical features contribute to its distinctive job description (§2).

What's more, this job description can be bolstered by exploring new and fruitful applications of ground. One such application is to the characterization of an entity's being *eliminable* from the ultimate account of reality: roughly, it is eliminable if all the facts about it are grounded in facts not about it ([Raven \[ms\]](#)). Because this characterization crucially appeals to ground instead of other kinds

of dependence, it does not prejudice whether ineliminable entities can depend on others. A distinctive advantage of this characterization is that it can apply even to “bottomless” scenarios in which each entity depends on yet others “all the way down”.¹⁷

REFERENCES

- ARISTOTLE. (1984). *The Complete Works of Aristotle*. Edited by J. Barnes. Vol. 1 and 2. Princeton: Princeton University Press.
- AUDI, PAUL. (2012a). "A Clarification and Defense of the Notion of Grounding." In *Metaphysical Grounding: Understanding the Structure of Reality*, edited by F. Correia and B. Schnieder. Cambridge: Cambridge University Press.
- . (2012b). "Grounding: Toward a Theory of the *In-Virtue-Of* Relation." *The Journal of Philosophy* 109 (12): 685-711.
- BARNES, ELIZABETH. (ms). "Symmetric Dependence." *unpublished manuscript*.
- BATCHELOR, RODERICK. (2010). "Grounds and Consequences." *Grazer Philosophische Studien* 80: 65-77.
- BENNETT, KAREN. (2011a). "By Our Bootstraps." *Philosophical Perspectives* 25 (1): 27-41.
- . (2011b). "Construction Area (No Hard Hat Required)." *Philosophical Studies* 154 (1): 79-104.
- BLISS, RICKI LEIGH. (2013). "Viciousness and the Structure of Reality." *Philosophical Studies* 166 (2): 399-418.
- . (2014). "Viciousness and Circles of Ground." *Metaphilosophy* 45 (2): 245-56.
- BLOCK, NED. (2014). "The Canberra Plan Neglects Ground." In *Qualia and Mental Causation in a Physical World: Themes from the Philosophy of Jaegwon Kim*, edited by T. Horgan, M. Sabates and D. Sosa. Cambridge: Cambridge University Press.

¹⁷ Thanks to Margaret Cameron, Kathrin Koslicki, Jon Litland, Colin Marshall, Mark Puestohl, Kelly Trogon, and an anonymous referee for helpful feedback on earlier drafts of this essay.

- BLOCK, NED, AND ROBERT STALNAKER. (1999). "Conceptual Analysis, Dualism, and the Explanatory Gap." *The Philosophical Review* 108 (1): 1-46.
- BOLZANO, BERNARD. (1837). *Wissenschaftslehre*. 4 vols. Sulzbach: Seidel.
- CAMERON, ROSS P. (2008). "Turtles All the Way Down: Regress, Priority, and Fundamentality." *The Philosophical Quarterly* 58 (230): 1-14.
- CHALMERS, DAVID J., AND FRANK JACKSON. (2001). "Conceptual Analysis and Reductive Explanation." *The Philosophical Review* 110 (3): 315-60.
- CHUDNOFF, ELIJAH. (ms). "Grounding and Entailment." *unpublished manuscript*.
- CLARK, M. J., AND D. LIGGINS. (2012). "Recent work on grounding." *Analysis* 72 (4): 812-23.
- CORREIA, FABRICE. (2010). "Grounding and Truth-Functions." *Logique et Analyse* 53 (211): 251-79.
- . (2013). "Metaphysical Grounds and Essence." In *Varieties of Dependence: Ontological Dependence, Grounding, Supervenience, Response-Dependence*, edited by M. Hoeltje, B. Schnieder and A. Steinberg. Munich: Philosophia Verlag.
- . (2014). "Logical Grounds." *The Review of Symbolic Logic* 7 (1): 31-59.
- CORREIA, FABRICE, AND BENJAMIN SCHNIEDER. (2012). "Grounding: An Opinionated Introduction." In *Metaphysical Grounding: Understanding the Structure of Reality*, edited by F. Correia and B. Schnieder. Cambridge: Cambridge University Press.
- DALY, CHRISTOPHER. (2012). "Scepticism about Grounding." In *Metaphysical Grounding: Understanding the Structure of Reality*, edited by F. Correia and B. Schnieder. Cambridge: Cambridge University Press.
- DASGUPTA, SHAMIK. (2014). "On the Plurality of Grounds." *Philosophers' Imprint* 14 (20).
- . (2015). "The Possibility of Physicalism." *The Journal of Philosophy* forthcoming.
- . (forthcoming). "Metaphysical Rationalism." *Noûs*.

- DELLA ROCCA, MICHAEL. (2012). "Violations of the Principle of Sufficient Reason (in Leibniz and Spinoza)." In *Metaphysical Grounding: Understanding the Structure of Reality*, edited by F. Correia and B. Schnieder. Cambridge: Cambridge University Press.
- DEROSSET, LOUIS. (2013a). "Grounding Explanations." *Philosophers' Imprint* 13 (7).
- . (2013b). "What is Weak Ground?" *Essays in Philosophy* 14 (1): 7-18.
- EVANS, MATTHEW. (2012). "Lessons from *Euthyphro* 10a-11b." *Oxford Studies in Ancient Philosophy* 42: 1-38.
- FINE, KIT. (1994). "Essence and Modality." *Philosophical Perspectives* 8: 1-16.
- . (2001). "The Question of Realism." *Philosophers' Imprint* 1 (2): 1-30.
- . (2005). "Necessity and Non-existence." In *Modality and Tense: Philosophical Papers*.
- . (2010). "Some Puzzles of Ground." *Notre Dame Journal of Formal Logic* 51 (1): 97-118.
- . (2012a). "Guide to Ground." In *Metaphysical Grounding: Understanding the Structure of Reality*, edited by F. Correia and B. Schnieder. Cambridge: Cambridge University Press.
- . (2012b). "The Pure Logic of Ground." *The Review of Symbolic Logic* 25 (1): 1-25.
- . (2013). "Fundamental Truths and Fundamental Terms." *Philosophy and Phenomenological Research* 87 (3): 725-32.
- . (2015). "Unified Foundations for Essence and Ground." *Journal of the American Philosophical Association* forthcoming.
- HAFNER, J., AND P. MANCOSU. (2005). "The Varieties of Mathematical Explanation." In *Visualization, Explanation, and Reasoning Styles in Mathematics*, edited by P. Mancosu, K. Jørgensen and S. Pedersen. Berlin: Springer.
- HOFWEBER, THOMAS. (2009). "Ambitious, Yet Modest, Metaphysics." In *Metametaphysics: New Essays on the Foundations of Ontology*, edited by D. Chalmers, D. Manley and R. Wasserman. Oxford: Oxford University Press.

- JAVIER-CASTELLANOS, AMIR A. (2014). "Some Challenges to a Contrastive Treatment of Grounding." *Thought* forthcoming.
- JENKINS, CARRIE S. (2011). "Is Metaphysical Grounding Irreflexive?" *The Monist* 94 (2): 267-76.
- KOSLICKI, KATHRIN. (2012). "Varieties of Ontological Dependence." In *Metaphysical Grounding: Understanding the Structure of Reality*, edited by F. Correia and B. Schnieder. Cambridge: Cambridge University Press.
- . (forthcoming). "The Coarse-Grainedness of Grounding." *Oxford Studies in Metaphysics*.
- KRÄMER, STEPHAN. (2013). "A Simpler Puzzle of Ground." *Thought* 2 (2): 85-89.
- LEIBNIZ, GOTTFRIED WILHELM VON. (1989). *Leibniz: Philosophical Essays*. Translated by R. Ariew and D. Garber. Indianapolis: Hackett.
- LEUENBERGER, STEPHAN. (2014). "Grounding and Necessity." *Inquiry* 57 (2): 151-74.
- LEWIS, DAVID. (1999). "New Work for a Theory of Universals." In *Papers in Metaphysics and Epistemology*. Cambridge: Cambridge University Press.
- LITLAND, JON ERLING. (2013). "On Some Counterexamples to the Transitivity of Grounding." *Essays in Philosophy* 14 (1): 19-32.
- . (ms-a). "Grounding Grounding." *unpublished manuscript*.
- . (ms-b). "Is Grounding an Internal Relation?" *unpublished manuscript*.
- . (ms-c). "Pure Logic of Many-Many Ground." *unpublished manuscript*.
- MCLAUGHLIN, BRIAN, AND KAREN BENNETT. (2011). "Supervenience". In *Stanford Encyclopedia of Philosophy*, edited by E. N. Zalta: The Metaphysics Research Lab.
- MULLIGAN, KEVIN, PETER SIMONS, AND BARRY SMITH. (1984). "Truth-Makers." *Philosophy and Phenomenological Research* 44 (3): 287-321.
- NOLAN, DANIEL. (2014). "Hyperintensional Metaphysics." *Philosophical Studies* 171 (1): 149-60.
- PLATO. (1997). "Euthyphro." In *Plato: Complete Works*, edited by J. M. Cooper. Indianapolis: Hackett Publishing Company.

- RAVEN, MICHAEL J. (2009). *Ontology, From a Fundamental Point of View*. Ph.D. Thesis, New York University, ProQuest/UMI.
- . (2012). "In Defence of Ground." *Australasian Journal of Philosophy* 90 (4): 687-701.
- . (2013). "Is Ground a Strict Partial Order?" *American Philosophical Quarterly* 50 (2): 191-99.
- . (ms). "Fundamentality without Foundations." *unpublished manuscript*.
- REEVE, C. D. C. (2000). *Substantial Knowledge: Aristotle's Metaphysics*. Indianapolis: Hackett Publishing Company.
- RODRIGUEZ-PEREYRA, GONZALO. (ms). "Grounding is Not a Strict Order."
- ROSEN, GIDEON. (2010). "Metaphysical Dependence: Grounding and Reduction." In *Modality: Metaphysics, Logic, and Epistemology*, edited by B. Hale and A. Hoffmann. Oxford: Oxford University Press.
- SCHAFFER, JONATHAN. (2009). "On What Grounds What." In *Metametaphysics: New Essays on the Foundations of Ontology*, edited by D. Chalmers, D. Manley and R. Wasserman. Oxford: Oxford University Press.
- . (2012). "Grounding, Transitivity, and Contrastivity." In *Metaphysical Grounding: Understanding the Structure of Reality*, edited by F. Correia and B. Schnieder. Cambridge: Cambridge University Press.
- . (forthcoming). "Grounding in the Image of Causation." *Philosophical Studies*.
- SCHNIEDER, BENJAMIN. (2011). "A Logic for 'Because'." *Review of Symbolic Logic* 4: 445-65.
- SIDER, THEODORE. (2011). *Writing the Book of the World*. Oxford: Oxford University Press.
- . (2013). "Replies to Dorr, Fine, and Hirsch." *Philosophy and Phenomenological Research* 87 (3): 733-54.
- SKILES, ALEXANDER. (2015). "Against Grounding Necessitarianism." *Erkenntnis* forthcoming.
- STEINER, MARK. (1978). "Mathematical Explanation." *Philosophical Studies* 34 (2): 135-51.

- STREVENS, MICHAEL. (2008). *Depth: An Account of Scientific Explanation*. Cambridge: Harvard University Press.
- TAHKO, TUOMAS E. (2013). "Truth-Grounding and Transitivity." *Thought* 2 (4): 332-40.
- . (2014). "Boring Infinite Descent." *Metaphilosophy* 45 (2): 257-69.
- TATZEL, ARMIN. (2002). "Bolzano's Theory of Ground and Consequence." *Notre Dame Journal of Symbolic Logic* 43 (1): 1-25.
- TROGDON, KELLY. (2013a). "Grounding: Necessary or Contingent?" *Pacific Philosophical Quarterly* 94: 465-85.
- . (2013b). "An Introduction to Grounding." In *Varieties of Dependence: Ontological Dependence, Grounding, Supervenience, Response-Dependence*, edited by M. Hoeltje, B. Schnieder and A. Steinberg. Munich: Philosophia Verlag.
- WILSON, JESSICA. (2014). "No Work for a Theory of Grounding." *Inquiry* 57 (5-6): 535-79.