Fundamental Things: Theory and Applications of Grounding

Louis deRosset

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1 Description

Much of philosophy consists of proposing and evaluating explanations of a certain sort. We want to know, for instance, what made Oswald's assassination of Kennedy morally wrong. Opinions on this question differ. Kantians propose one sort of answer, consequentialists another, and virtue theorists a third. Similarly, a central question in epistemology concerns what it is in virtue of which I am justified in believing that I have hands. In metaphysics, we sometimes wonder what it is in virtue of which things have the modal or temporal properties that they do. These examples could be multiplied.

As the examples indicate, the demand for explanations of this sort is not confined to metaphysics. It is not confined to philosophy, either. Scientists often ask after explanations of just this sort. Chemists may wonder what makes alcohol miscible in water. Medical researchers can tell us what it is in virtue of which arsenic is toxic. And physicists are hoping to discover what makes gravity so weak in comparison to the electromagnetic, weak, and strong nuclear interactions.

There are many different kinds of explanation. What kind is proposed in response to these questions? Evidently it is not an epistemic explanation: the ethicist's question concerning what makes certain acts morally wrong asks after neither evidence for their wrongness nor a helpful criterion for determining in the course of deliberation what morality requires. Similarly, the explanations on offer don't seem to be ordinary causal explanations. The question of what makes alcohol miscible in water may be answered by citing causal mechanisms, but seems not itself to be an explanation for why something in fact occurs. Similarly, the explanation of what it is in virtue of which there might have been purple penguins may cite causal mechanisms without offering any causal explanation for the possibility of purple penguins.

The proffered explanations appear, however, to share a feature with causal explanation: the explanations trace a relation of dependence and determination obtaining between *explanans* and *explanandum*. The facts in virtue of which I am justified in believing that I have hands are facts on which my justification

depends and by which it is determined. But the sort of dependence and determination in question differs from ordinary causal dependence and determination in a crucial way. The facts in virtue of which I am justified in believing that I have hands are more fundamental than the fact that I am so justified. A true explanation of what makes me justified tells us what my justification rests on or (in the circumstances and for the present time) consists in. In a word, those facts are more fundamental than my justification. Similarly, the physical facts in virtue of which alcohol is miscible in water are more fundamental than that fact. By contrast, ordinary causal explanations for events typically cite *explanantia* that are no less fundamental than those events. Explaining the movement of a billiard ball by appeal to a collision with another billiard ball a second ago does not tell us what that movement consists in or rests on and does not cite facts that are more fundamental than the fact that the ball moves as it does.

Grounding is the term recently introduced for this relation of dependence and determination. The explanations which trace grounding relations are termed *grounding explanations*. In the literature which discusses grounding, it is often identified with metaphysical explanation. But, as the examples show, there is nothing distinctively metaphysical about it. Demands for grounding explanations do occur in metaphysics, but they also occur in other branches of philosophy and the sciences.

Though the term 'grounding' is new, there is nothing new about the notion itself. Like some of the questions that deploy it, the notion of grounding is at least as old as systematic human inquiry. And, even before we had a term for grounding, philosophers in various areas of inquiry theorized about it. We have not always clearly separated grounding from related relations. Grounding, like other metaphysical notions, has not always been thoroughly disentangled from various epistemic and semantic dependence relations. Even when we have filtered out epistemic relations, the tendency of researchers in recent decades who have discussed grounding *per se* is to propose analyses or explications of the idea in other terms. What is new in the discussion of grounding are three ideas: (*i*) that grounding may be conceptually primitive, in the sense that no helpful analysis or explication in other terms can or should be given; (*ii*) that we can theorize about it nonetheless; and (*iii*) that applying the resulting theory sheds light on on central philosophical debates.

In this book, I propose to explore the extent to which this trio of claims might be vindicated. In particular, I will assume as a working hypothesis that there is no helpful analysis or explication of grounding in other terms. (So, for better or worse, there will be no argument for (*i*).) I will offer a theory of grounding. The theorizing will consist in saying in more detail what grounding is and how it relates to explanations of the relevant sort, discussing objections to the deployment of a notion of grounding, and drawing points of contrast between a grounding-centered approach to relative fundamentality and other approaches in the literature. I will then show how this theorizing bears fruit in the investigation of other interesting questions. Thus, the thesis of the book is that we should embrace the recent upwelling of theorizing about grounding because it does good theoretical work: the theory of grounding sheds light when

it is applied to questions in which we were antecedently interested.

The applications on which I focus reflect my interests and expertise. They all concern metaphysics, and, more specifically, the nature of the relation between the less fundamental and the more fundamental. In particular, I will consider applications of grounding to the following questions:

- **Realism and Anti-Realism**: How, if at all, might one distinguish between truths that reveal how *reality is in itself* and truths that do not?
- **Ockham's Razor**: What is the proper formulation of Ockham's Razor? How, if at all, does the Razor apply to the non-fundamental?
- **Truth**: How ought we to understand truth ascriptions?
- **Auto-Application**: How can grounding facts connect the fundamental to the non-fundamental?
- **Non-Reductive Physicalism**: In what sense is a specification of the physical facts complete if there are non-physical facts that are irreducible to physical facts? How, barring reduction, can the existence and features of non-physical entities be grounded in purely physical facts?

2 Chapter Plan

The book will contain eight chapters, divided into two parts. Part one, comprising the first three chapters, gives the background theory of grounding. The remaining chapters explore applications.

2.1 Theory

Chapter One: Grounding and Fundamentality

In this chapter, I introduce the notion of grounding by appeal to its link to explanations of the relevant sort. I start by rehearsing the now familiar idea that the world is organized into layers. There are, for instance, chemical, biological, geological, psychological, sociological, and economic facts, all of which appear to rest on further facts. Facts involving cities, *e.g.*, the fact that Beijing has over 14 million inhabitants, are not rock-bottom: city facts are determined by and dependent on facts concerning where people live, how they act, and what their attitudes are. Those further facts involving human beings rest, in turn, on other facts, including facts involving organs, cells, and genes; those in turn rest on chemical facts; and so it goes, at least for a while. Reality comes in layers. As in other cases in which there are relations of dependence and determination, those relations are traced by a certain sort of explanation, which we might call *inter-level explanation*.

Inter-level explanations, I will contend, are a species of grounding explanations. Hence, they trace grounding relations. But this generic conception

of grounding as linked to both explanation and fundamentality leaves many questions open, which I plan to engage in this chapter. For instance, inter-level explanations track relations of dependence and determination between the facts expressed in the *explanans* and the facts expressed in the *explanandum*. But traditional explications of layered structure advert in the first instance to relations of dependence and determination among the entities involved in those facts. Discussion of layered structure in the philosophy of mind, for instance, has standardly focused on the relation of dependence and determination between psychological *properties* or *events* and correlative neurological *properties* or *events*. These two kinds of layered structure correspond to two relations of dependence and determination: one kind obtains among facts, and the other among other entities, including, say, properties. The first we might call *fact-grounding* and the second *entity-grounding*. I will explore the relationship between fact-grounding and entity-grounding, defending a theory on which fact-grounding is the more basic notion.

Inter-level explanations yield a sort of relative fundamentality: the facts involving people in virtue of which Beijing has more than 14 million inhabitants are *more fundamental* than the fact that Beijing has more than 14 million inhabitants. Another question I plan to engage in this chapter concerns the relation between this sort of relative fundamentality and a notion of absolute fundamentality. The class of (absolutely) fundamental facts and entities has two features: (*i*) *independence*: members of the class are not dependent on or determined by anything else (in a sense to be explicated); and (*ii*): *completeness*: everything else depends on and is determined by members of the class. There are a host of problems with properly understanding these ideas which I plan to discuss. I also plan to discuss certain controversial formal features of grounding, including its transitivity and asymmetry.

Finally, I will also discuss the relation between grounding and other forms of dependence and determination. The most important of these is causation. It has recently been suggested that there is a tight connection between causation and grounding. I will explore the similarities and differences between these two kinds of dependence and determination.

Chapter Two: Objections to Grounding

In this chapter, I defend the introduction of grounding against various forms of skepticism about the idea. There are four kinds of skepticism I will discuss.

Hard Eliminationism The notion of grounding is junk. We should never have talked this way, at least for the purposes of serious theorizing. Questions formulated in these terms should be discarded, not answered. There simply is no relation of dependence and determination that F, the x's, G, and y stand in that is expressed by sentences of the form 'Gy in virtue of the fact that $Fx_0, x_1, ..., x_n$.'

Soft Eliminationism There is something to the idea expressed by sentences of the form 'Gy in virtue of the fact that $Fx_0, x_1, ..., x_n$.' There is a relation

that F, the x's, G, and y stand in that is expressed by such sentences. But that relation is third-class: theorizing about it yields no fruit.

Revolutionary Reductionism There is something to the idea expressed by sentences of the form 'Gy in virtue of the fact that $Fx_0, x_1, ..., x_n$', and utterances of those sentences express a grounding relation. But that relation is second-class: the theoretical purposes that such talk serves can be served better by deploying some successor notion or notions.

Conciliatory Reductionism There is something to the idea expressed by sentences of the form 'Gy in virtue of the fact that $Fx_0, x_1, ..., x_n$', and utterances of those sentences express a grounding relation. But that relation is identical to some relation expressible in other terms.

I intend to explore arguments for each kind of skepticism. My working hypothesis is that none of those arguments are dispositive.

Chapter Three: Grounding and Reduction

Traditional explications of the idea of layered structure have deployed notions of reduction rather than grounding. In this chapter, I will explore the relationship between these two ideas. (Actually, 'reduction' is often used to stand for very different ideas, so I will be exploring the relationship between grounding and a cluster of ideas.) This chapter will start by articulating a central kind of reduction, which involves the identification of facts. Suppose we have two true theories, each with its own vocabulary and principles. Then one theory reduces to another, in this sense, iff each fact stated by a truth of the first theory is identical to a fact stated by a truth of the second. Let's call this sort of reduction an *identity reduction*. I will argue that the notion of identity reduction captures much of what theorists say about related forms of reduction, including forms that identify property types or tokens, and forms that require definability of terms of the reduced theory in terms of the reducing theory.

I will contrast grounding with identity reduction by exploring a certain variety of multiple realizability argument against identity reductions. This sort of argument emphasizes intensional mismatch between the putative reducer and the putative reduced entity. Suppose our candidate reducing theory is final physics, and our candidate reduced theory is final psychology. A multiple realizability argument of this sort claims that, for some truth P of final psychology, it is possible that P while no claim of final physics is true. Assuming that the identity of the facts expressed by P and some other truth requires that the sentences be co-intensional, it follows that P does not express any fact expressed by any truth of final physics.

I will contrast grounding with identity reduction by noting that grounding, unlike identity reduction, is consistent with the joint truth of the premises of this sort of multiple realizability argument. I will contrast this sort of multiple realizability argument with more epistemically driven multiple realizability

arguments, exploring a view on which those epistemically driven arguments provide no reason to reject identity reduction. Also, I will explore the bearing of this sort of multiple realizability argument on weaker varieties of reduction.

Finally, I will discuss competing approaches to inter-level explanation that share important features with identity reduction, including Ted Sider's approach focused on metaphysical semantics, and Agustin Rayo's and J.R.G. Williams's approaches focusing on requirements on reality for a sentence to be true.

2.2 Applications

Chapter Four: Grounding the Unreal

In this chapter, I distinguish two kinds of layered structure that I have not clearly separated in earlier discussions. On one hand, there is a layered structure of dependence and determination among *theories*: Economic theory is dependent on and determined by psychological theory; psychological theory in its turn is, plausibly, dependent on and determined by biological theory; and so on. On the other hand, it is tempting to explain this layered structure of dependence and determination among our theories by appeal to a corresponding layered structure of dependence and determination among the *entities* putatively treated by those theories: economic truths are grounded in psychological truths in virtue of the fact that the economic facts, properties, and individuals are grounded in the psychological facts, properties, and individuals.

In this chapter, I will argue that we can resist this temptation: we can explain the sense in which, *e.g.*, the biological truths are dependent on and determined by chemical truths without appealing to properly biological or chemical entities. This opens the door to a view on which, though there are more truths than just the purely physical truths, there are no entities, states, or properties other than the purely physical entities, states, and properties. I will argue that some more familiar strategies to accommodate a layered structure of theories without appealing to a corresponding layered structure of entities encounter difficulties. I will then show how these difficulties point the way to a more satisfactory treatment which appeals to something very close to the notion of ground. Finally, I will show how this treatment provides a theoretical setting in which we might fruitfully frame debates about which entities there really are.

Chapter Five: Grounding and the Razor

Ockham's Razor is a key tool for theory choice. It has recently been suggested that grounding bears on the proper articulation of Ockham's Razor. In particular, it has been suggested that grounded entities are an "ontological free lunch", in that positing a grounded entity does not count against a theory when comparing its cost in ontological commitments to that of a competing theory. So, on this view, if two theories posit the same ungrounded entities, but the first theory, but not the second, affirms the existence of some range of grounded entities, then Ockham's Razor does not apply to favor the second over the first.

This abstract claim applies to first-order ontological disputes. For instance, one might argue on broadly Ockhamite grounds that we should not believe in macroscopic concrete entities. The idea is that all of the explanatory work that can be done by positing, *e.g.*, a baseball is already done by positing those entities in virtue of which the baseball exists and has the features it does. Suppose that the existence and features of the baseball are grounded in the fact that certain particles are arranged baseball-wise in a certain spacetime region. Consider a theory that posits the existence of a baseball on the basis that it explains "baseball" observations, window-breaking events, and the like. Suppose this theory also grounds the baseball facts in there being certain particles that have a "baseballwise" arrangement. Then, it seems, the baseballwise arrangement of particles can explain "baseball" observations and window-breaking events at least as well as the baseball can. So, we have a competing theory, according to which there are no baseballs, but there are baseballwise arrangements of particles. This second theory does as well as our original theory at explaining phenomena, but does not incur the extra cost of positing baseballs.

On the view that grounded entities are an "ontological free lunch," the extra cost is nil. Thus, the conclusion goes, Ockham's Razor provides no reason not to accede to the common sense view that there are baseballs in addition to the arrangements of particles by virtue of which they exist and have the features they do. In this chapter, I will explore an argument that grounded entities are no "ontological free lunch." The basic complaint is that there are clearly warranted applications of Ockhamite principles to erstwhile grounded entities.

I will also explore results of this discussion for the debate over whether there is a fundamental layer of nature. Suppose that we have a case of *bottomless infinite descent*: for each fact (or other entity), there is some fact that grounds it. If Ockham's Razor, properly formulated, does apply to non-fundamental entities, then, for every fact or other entity posited by some theory, there is a theory that does not posit it that does better that that theory on Ockhamite grounds. Thus, for any particular putative fact or entity, we have Ockhamite reasons to disbelieve in it. If, on the other hand, there is a fundamental layer, then positing anything in that layer is undefeated by Ockhamite considerations. I will explore the extent to which this favors denying that there is bottomless infinite descent.

Chapter Six: The Metaphysical Transparency of Truth

This chapter concerns *transparency theses* about truth. A transparency thesis holds that an ascription of truth to an individual sentence "adds nothing" to what the sentence says, in a sense badly in need of explanation. Transparency theses trace back at least to work by F.P. Ramsey, and there are well-known transparency theses already in the literature. Generally, these theses fall into two sorts. First, there are *syntactic transparency theses*, which hold that every sentence that ascribes truth abbreviates or disguises some sentence which does not. For instance, one syntactic transparency thesis is that

(1) It is true that snow is white

and

(2) 'Snow is white' is true

abbreviate or disguise

(3) Snow is white.

Alternatively, *semantic transparency theses* hold that every meaningful truth-ascribing sentence is semantically equivalent to some non-truth-ascribing sentence, whether or not the sentences have the same underlying syntactic form. To illustrate, one semantic transparency thesis holds that a truth ascription like (1) expresses the same proposition as the non-truth-ascribing sentence (3).

These transparency theses face some well-known problems. They propose strong linguistic hypotheses that should be adopted only on the basis of strong linguistic evidence, but that evidence all points the other way. Still, the claim that (1) "adds nothing" to (3) is intuitively compelling. We shouldn't give up on that idea just because the syntactic and semantic transparency theses fail to offer a plausible explanation of it. Rather, we should look for a more plausible explanation.

In this chapter, I offer a ground-theoretic account of the respect in which truth ascriptions "add nothing." On this account, 'true' is *metaphysically transparent*: facts stated using it must be grounded, but they don't ground anything. Sentences ascribing truth do appear in explanations. For instance, they appear in explanatory arguments of the the form

(4) Snow is white; so, 'Snow is white' is true; so, something is true.

But their role in such arguments is to indicate that whatever grounds them also grounds the conclusion.

I will argue in this chapter that adopting the metaphysical transparency thesis captures the vague but compelling sense in which truth ascriptions like (1) "add nothing", and apply the view to solve a number of puzzles in the literature concerning how truth ascriptions are grounded.

Chapter Seven: Auto-Application

This chapter applies grounding to the question of how grounding facts themselves are grounded. Ted Sider has recently argued that the use of the notion of grounding to articulate the layered conception faces a problem, which I call *the collapse*. The collapse turns on the question of how to ground the facts stated by grounding claims. In this chapter I make a suggestion about how to ground grounding claims that avoids the collapse. Briefly, the suggestion is that the fact stated by a grounding claim is grounded in its *explanans*. I will argue that this solution is motivated by the link between grounding and grounding explanations, discuss criticisms of it in the literature, contrast it with an extant alternative solution proposed by Shamik Dasgupta, and draw some lessons concerning the nature of grounding from the discussion.

Chapter Eight: The Nonreductivist's Troubles with Explanation

This chapter explores a problem for using grounding unaccompanied by identity reduction to vindicate a nonreductive physicalism. The problem centrally concerns a constraint on grounding explanation which is independently plausible and implicitly assumed in a wide variety of areas of inquiry. Suppose that some individual r has a feature F, and we are considering an explanatory proposal for that fact that has the form

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

A *confounding case* for an explanatory proposal of this form is a case in which there is an individual a and some individuals $b_1, b_2, ..., b_n$ which satisfy the proposed *explanandum* $\phi(r, t_1, \ldots, t_n)$ even though a lacks F. Intuitively, a confounding case is a situation in which the putative *explanans* obtains, but the *explanandum* does not. The constraint in question is that an explanatory proposal should be rejected if there is a confounding case for it. Call this the *determination constraint*.

On overwhelmingly plausible principles it is straightforward to show that, absent identity reduction, the determination constraint entails that every entity involved in any fact is fundamental, in the sense given to that idea in Chapter One. Thus, every such entity is part of fundamental reality. This poses a prima facie problem for nonreductive physicalism, which entails that (*i*) there are facts regarding certain psychological entities, including psychological properties and events; (*ii*) some of those psychological facts are not reducible to physical facts and the entities they involves are in no sense physical; but (*iii*) all fundamental entities are physical.

In this chapter, I will explain why this is a problem, discuss the prospects for rejecting the determination constraint, contrast the problem with Jaegwon Kim's argument for a similar conclusion, and suggest ways in which a nonreductivist might solve the problem.

3 Schedule

I already have journal article versions or very substantial drafts of Chapters Four, Seven, and Eight. I will be developing a draft of Chapter Six over the next couple of months. Some of the material for the first three chapters is scattered over work I have in print or forthcoming, but those chapters would need to be newly drafted, more or less from scratch. Chapter Five I have in the form of a talk and accompanying slides, so it would need to be drafted. Even the material I already have in draft will need to be substantially revised and extended. I expect that I would have a complete working draft of the manuscript in approximately a year's time, and that workshopping that material and revising in light of feedback would take an additional year. So, I estimate that it will be two years before I have a completed manuscript suitable for submission to the Press.