

EXPLAINING EXPLANATIONS: GROUNDING, METAPHYSICAL EXPLANATION, AND  
THE STRUCTURE OF REALITY

by

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## ABSTRACT

The goal of this thesis is to uncover the nature of the phenomenon known as Grounding and elucidate the role it plays in metaphysical explanation. More specifically, I argue that the posit of Grounding is needed in order to form successful accounts of metaphysical explanation.

In order to motivate my position, I demonstrate that three principles of successful explanations correspond to three features of reality's structure. First, successful explanantia are able to express that the explanandum depends on the explanans. I refer to this principle as Dependence. The second feature I identify of successful explanations is what I call Distance; while multiple potential explanantia fully determine a given explanandum, an explanation is liable fail if it does not cite the correct explanans. Finally, I recognize that certain classes of explanantia are unable to explain a given explanandum in virtue of the category facts to which they appeal. This is a principle I call Unification.

I argue that these features of explanations manifest because they are a product of reality's structure. First, I argue that Dependence is a function of fundamentality; we often take the explanans in a given explanation to be more fundamental than the explanandum. Further, our talk of fundamentality is largely univocal, and only by accepting some degree of univocality can we properly account for Dependence. Subsequently, I articulate the intuition that the entities embedded in this structural tapestry are more or less fundamental than others and proceed to explain the connection between relative fundamentality and the principle of Distance. Finally, I discuss the structural feature I call Layers, which states that reality's structure is partitioned into categories. Layers accounts for the principle of Unification by unifying the sorts of facts needed to support explanations.

From there, I construct two viable views for metaphysical explanation. The Robust View posits a highly unified notion of structure and satisfies all the explanatory and structural features described in the foregoing paragraphs. In comparison, structure under the Hybrid View is more disunified and contains the least degree of structural unification needed to support a theory of explanation.

The upshot of this account of explanation is that a certain class of metaphysical explanations track structure, and, insofar as we need Grounding to limit structure, the posit of Grounding is needed to account for these features of explanations.

For my mother,  
to whom I'm still trying to explain explanations.

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## TABLE OF CONTENTS

Abstract.....	iii
Dedication.....	v
Acknowledgements.....	vi
Chapter 1: Prologue.....	1
Chapter 2: Explaining Explanations.....	4
2.1 Defining ‘Explanation’.....	4
2.2 Unionism and Separatism.....	8
2.3 Skepticism and the Argument from Indispensability.....	13
Chapter 3: Structure and Explanation .....	17
3.1 Dependence and Univocality.....	17
3.2 Distance and Proximity.....	27
3.3 Unification and Layers.....	33
Chapter 4: Wrapping It All Up.....	40
4.1 The Robust View.....	40
4.2 The Hybrid View.....	42
4.3 Conclusion: Indispensable to What?.....	46
Bibliography.....	51
Appendix: Glossary.....	54

## Chapter 1: Prologue

In recent times, there has been a revolution in metaphysics. Before the revolution, the metaphysician was tasked with discovering what types of things exist. In “On What There Is,” W.V.O Quine quite famously argued that our ontology should resemble a desert landscape which attributes existence only those entities indispensable to our best physical theories (Quine 1948); as a result, some of the more quotidian ontological kinds such as tables and chairs are likely to be pruned away. After the revolution, however, existence questions have now been replaced with dependence questions. “Chairs exist,” says the modern metaphysician, “but they simply depend on something else for their existence.” Thus, the dependence theorist will distinguish between derivative entities, such as chairs, molecules, and sapphires, from those entities which are fundamental, such as quarks, numbers, and whatever turtles may be lurking in most fundamental layer of reality. For these metaphysicians, some of the most salient questions in metaphysics are concerned not merely with what there is, but rather how what there is, is Grounded.

In order to express and analyze dependence, these metaphysicians admitted the primitive notion of Grounding into their ideology. However, as philosophers are prone both to skepticism and questioning the status quo, some metaphysicians grew doubtful of Grounding. After (Fine 2001) and (Schaffer 2008), a tremendous amount of literature was spawned to elucidate the nature of Grounding and what role it plays in metaphysics<sup>1</sup>. As Shamik Dasgupta remarks, “I began to read papers on ground that I didn’t really understand. The concept was being stretched and deformed in various ways—*reified* in various ways—that went far beyond what had initially attracted me to it” (Dasgupta 2017, 74). Indeed, there are many ways of understanding what

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<sup>1</sup> One may only survey the table of contents of *The Routledge Handbook of Metaphysical Grounding* to observe the dizzying array of topics to which Grounding has been invoked in analysis.

Grounding is. Some metaphysicians understand it as an objective, unified phenomenon that cleaves reality together (Fine 2001, Schaffer 2008, Trogon 2013, Bennet 2017). Others understand Grounding as something comparatively plural (Wilson 2014, Koslicki 2015, Maurin 2019). A few even understand it as a phenomenon that is mostly cognitive in nature and are skeptical that it has any objective correlate as part of reality (Thompson 2016, Miller and Norton 2016). As a result of these variegated and manifold conceptions of the subject, it is sometimes quite difficult to pin down what exactly it is with which metaphysicians are so concerned.

In its most inclusive form, I understand Grounding to be a comprehensive thesis about dependence, but because there are so many varieties of Grounding theorists (and varieties of each of these varieties), it is important to lay down some terminology. Let the Enthusiast be the dependence theorist who believes that Grounding is a unified phenomenon; that in each case where we talk of something depending on something else, we are utilizing a general, unified notion of dependence. Let the Skeptic be the metaphysician who believes that the Grounding revolution was a mistake and that there is no unified form of dependence. Let the Psychologist about Grounding be the theorist who believes Grounding is (mostly) cognitive in nature and hence has little to no realist import. The focus of this paper will be on the debate between the Enthusiasts and the Skeptics, and I will largely leave the Psychologists alone. However, as the paper progresses, it will become apparent that our view on Grounding has *deep* ramifications for what reality is like, so the upshot of my conclusions can likely be applied *mutatis mutandis* to the Psychologist's view of Grounding and reality as well. So far, the distinction between the Enthusiast and the Skeptic along with what Grounding exactly is might all sound a bit vague to the reader who isn't already familiar with the literature on these subjects, but don't worry. The

dispute between the Enthusiast and the Skeptic is quite robust, and what is at stake will soon be clearly explained and elucidated.

I will side with the Enthusiasts and argue that you should too. In short, I will demonstrate that there is an intimate relationship between the Enthusiast's view of Grounding (which I will henceforth simply refer to as 'Grounding'), the structure of reality, and metaphysical explanation. In chapter 2, I will describe what an explanation is and explicate two views pertaining to how we might understand it as connected to Grounding. Then, I will describe some of the objections typically invoked in opposition to Grounding. In chapter 3, I will describe three features of successful explanations and three corresponding features of reality's structure; then, I will argue that only the Enthusiast can account for these features. In chapter 4, I outline the Robust View which is highly unified account of structure. Then, I consider the more cautious Hybrid View which commits us to a less unified notion of structure but is still able to satisfy all the explanatory and structural features mentioned in chapter 3. Finally, I conclude by identifying the sub-class of metaphysical explanations I call Structural Explanations to which I take Grounding to be indispensable.

## Chapter 2:

### Explaining Explanations

#### 2.1 Defining 'Explanation'

Before we proceed, it would be good to provide an account of what an explanation is. I'll do so by sketching out a few paradigm cases.

First, imagine a situation in which you happen across a broken window and wonder what event or sequence of events led to this state of affairs. In this case, you are in need of an explanation. Second, suppose you consider the fact that the singleton-set Socrates exists and wonder why this is so. In this case, you are seeking an explanation for the existence of {Socrates}. Thirdly, imagine a world in which Joe is gambling at a casino. Specifically, he is trying his luck at slots, but, unfortunately, he never wins the Jackpot. Frustrated that he is losing money, Joe cries out, "Why don't I ever win?" Finally, consider that radioactive elements are those which possess unstable nuclei. If the difference between the number of protons and the number of neutrons in a given isotope is too great, then sometimes that atom will undergo radioactive decay and emit a positron. Suppose a scientist is working with an unstable isotope of plutonium, notices it emitted an positron, and begins to wonder why; she, too, is in need of an explanation. Bringing everything together, these are four instances of potential explanations:

SUSY: The window broke because Susy threw a rock at it.

SOCRATES: The fact {Socrates} exists obtains because the fact Socrates exists obtains.

GAMBLING: Joe lost money playing slots because the house always wins.

FISSION: The Plutonium atom emitted a positron because it underwent radioactive decay.

But what exactly is going on here? The way I see it, each of these propositions consist of at least three components. I will refer to the thing being explained as the explanandum, the thing doing the explaining as the explanans, and the linking word (in this case, it is the word ‘because’) that connects the explanans and the explanandum as the explanatory relation.<sup>2</sup> The explanatory relation can’t be just of any nature at all; rather, it must convey that there is some sort of determinative linkage between an explanans and an explanandum. Just how tight the determinative linkage must be is something I would like to leave open, but, even for those who favor a relatively loose degree of determination, this relation must render the manifestation of the explanandum more likely. Contrast this with some sort of non-determinative linkage between an explanans and an explanandum:

SUSY<sub>Election</sub>: Susy threw the rock at the window because  $2 + 2 = 4$ .

SUSY<sub>Election</sub> confuses me. Explanations are quite valuable because only they can answer ‘why’ questions, but this is something SUSY<sub>Election</sub> isn’t able to do.<sup>3</sup> The problem with this case isn’t simply that this explanation is unsuccessful because it doesn’t render the explanandum more likely to a sufficient degree. Instead, it is the fact that the explanans and explanandum seem totally unrelated; I might go as far as to say that content of the word ‘because’ at play in SUSY<sub>Election</sub> seems to be *empty*. If we understand the explanans as having the property of being explanatory, then the explanans of SUSY<sub>Election</sub> (which, in this case, is ‘Susy threw the rock at the

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<sup>2</sup> Generally, the appearance of the word ‘because’ is not required for the instantiation of an explanation. Other locutions are also acceptable: ‘in virtue of’ and ‘since’ might appear in place of ‘because,’ and there likely other terms that could play this role as well. In many cases, however, explanations are conveyed without the use of any explanatory locution at all.

<sup>3</sup> In this case, that question is, “Why did Susy throw the rock?”

window’) fails instantiate this property. As a result, I don’t think this case even counts as an explanation. Bearing this in mind, let explanatory realism be the view that C is an explanans for E in virtue of the fact that C renders E more probable.

Another thing to note is that not all of these explanations (SUSY, SOCRATES, GAMBLING, FISSION) seem to be of the same type. More specifically, we would say that SUSY and FISSION are causal explanations since they deal with causal phenomena, but SOCRATES and GAMBLING seem to be non-causal in nature. I will refer to these as metaphysical explanations. These two categories are quite distinct; causal explanations (often) proceed by making mention of events that happen across time. In contrast, metaphysical explanations deal with phenomena that have the feel of concerning the constitutive generation of a dependent outcome (Schaffer 2017, 303). Causal explanations are often understood to be supported in some way by causal relations, but since causal relations are not of the right nature to support metaphysical explanations, we will require something different for our theories of metaphysical explanation.<sup>4,5</sup>

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<sup>4</sup> So far, I have taken the distinction between causal and metaphysical explanations to be relatively intuitive, but perhaps more needs to be said for those who think the distinction remains opaque. One of way of cashing out the distinction between metaphysical explanations and causal ones is to say that metaphysical explanations take place synchronically while causal ones happen diachronically. While this is a useful way of distinguishing between the two, it is not without (putative) exception. A. Wilson points out, for example, that my being a human as opposed to my being a swampman is grounded (or rather “explained by” if you prefer a different locution) in my past causal history. Nonetheless, SWAMPMAN has the flavor of a metaphysical explanation. Likewise, causal events in which quantum or gravitational action happens at a distance might be said to be synchronic (A. Wilson, 2018).

Moreover, we occasionally use causal locutions to denote explanations which I believe are most aptly characterized as metaphysical in nature. For example, suppose we explain why World War 1 occurred by appealing to the fact that Archduke Franz Ferdinand of Austria-Hungary was assassinated by a Serbian extremist group. In this case, we would say that WW2 was *caused* by the assassination of Archduke Franz Ferdinand of Austria-Hungary. Wars, assassinations, and the other factors leading to World War 1 (militarization, détetes, etc.) are clearly metaphysical concepts, but this explanation proceeds by identifying something resembling a diachronic form of metaphysical determination. For the reasons, I prefer to think of metaphysical explanations as having to do with the nature, existence, or essence or things while causal explanations don’t. I would like to leave open the issue of how to define metaphysical explanation, so I intend for this characterization to be more heuristic in nature rather than definitional.

<sup>5</sup> Although, some metaphysicians (Schaffer 2016, A. Wilson 2018) have advanced a theory of Grounding which identifies causation as a form of Grounding. While this view has not gone undisputed, my argument for Enthusiasm will not commit us to any view about the relationship between Grounding and Causation.

Some Enthusiasts have justified the posit of Grounding in order to account for metaphysical explanation. As I noted in chapter 1, Grounding is a theory of dependence. If  $x$  grounds  $y$ , that is a way of saying that  $x$  accounts for  $y$ , or that  $y$  depends on  $x$ . Grounding is often taken to be necessitating; if the fact that  $x$  grounds the fact that  $y$ , then if  $x$  obtains then so will  $y$ . As a result, it has the modal power to support explanation. Grounding is also understood to be inherently explanatory; just as causal relations of the right kind to support causal explanations, proponents of Grounding assert that it can play a similar role in metaphysical explanation.

It's also worth noting that Grounding and explanation have much in common. First, explanations are said to be asymmetric, which is to say that if  $x$  explains  $y$ , then  $x$  cannot explain  $x$ ; endorsing this view restricts explanations from going in circles. Further, explanations are irreflexive. If  $x$  is in need of an explanation, then we cannot appeal to  $x$  to explain  $x$ . Finally, explanations are non-monotonic, which is to say that explanations can be falsified upon the discovery of something new. If my explanation for why the window broke appeals to the fact that Susy threw the rock but I later learn that the rock-thrower was John, then SUSY has become falsified. And while explanations have all these features, so does Grounding. Grounding is asymmetric; if  $x$  grounds  $y$ , then  $y$  cannot ground  $x$ . It is irreflexive;  $x$  cannot ground itself. And Grounding is non-monotonic; if  $y$  is grounded by the conjunction of  $(x_1, x_2, x_3\dots)$ , I am not committed to maintaining this belief upon learning  $x_n$ .

Using Grounding to account for metaphysical explanation has the benefit of articulating a counterview to explanatory antirealism. There are many forms of this view: one version of explanatory antirealism holds that explanations are just a matter of a speaker's attitudes. Another maintains that explanations are purely relative to the contexts in which they are given and have

no objective, mind-independent component.<sup>6</sup> The most notable form of explanatory anti-realism is perhaps Hempel's Humean deductive-nomological account of scientific explanation, which maintains that explanations merely convey facts about regularities in nature. In contrast, the explanatory realist believes that explanations hold as a matter of worldly determination. Since Grounding is a worldly, determinative relation, Enthusiasts will use Grounding to account for explanatory realism and maintain that there is no other viable way for the explanatory realist to articulate a view according to which explanation has an objective component.

## 2.2 Unionism and Separatism

From there, the Enthusiast could opt for one of two views about how Grounding is connected to (metaphysical) explanation. Firstly, she could be a Unionist and claim that Grounding simply is metaphysical explanation. The Unionist believes the fact that Grounding and Explanation share many of the same properties (asymmetry, non-monotonicity, etc.) is no coincidence; rather, it is because Grounding is a form of explanation that allows us to learn that Grounding has these properties in the first place.

Alternatively, the Enthusiast might be a Separatist about Grounding and explanation. To the Separatist, Grounding and explanation are distinct, and Grounding is related to explanation in that it backs explanation. The Separatist understands the relationship between Grounding and metaphysical explanation in a very similar way to how Jaegwon Kim understands the relationship between causation and causal explanation. For Kim, "C is an explanans for E in virtue of the fact that c bears to e some determinate objective relation R" (Kim 2010, 2). The

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<sup>6</sup> The Psychologists, for example, hold that Grounding as a mind-dependent relation that is reduced to the cognitive attitudes of individuals, and those who are sympathetic to this style of theory might utilize Grounding to articulate a view in which explanations are mind-dependent. In fact, (Thompson 2016) takes Grounding to be mind-dependent because it supports her view that explanations are mind-dependent.

Separatist move is to recite Kim's definition and identify the determinate objective relation R as Grounding. The most common Skeptic strategy is to deny that Unionism is viable as theory and proceed to assert that there are alternatives to Separatism in constructing an account of metaphysical explanation. First, let's explore the Unionist view. As Naomi Thompson explains, the argument against Unionist make goes a little something like this:

- (i) There is a tight connection between grounding and metaphysical explanation.<sup>7</sup>
- (ii) Metaphysical explanation has agent-relative features.
- (iii) Grounding is objective and mind-independent (Thompson 2016, 396).

The problem is that these three claims are jointly problematic. The Unionist holds that Grounding just is metaphysical explanation. If Grounding is mind-independent but we believe explanations to be agent-relative, then, by the Indiscernibility of Identicals, Grounding cannot be identical to (metaphysical) explanation. Thus, these premises give rise to a problem for the Enthusiast. The Enthusiast cannot deny (i) because that amounts to saying that Grounding doesn't have anything to do with metaphysical explanation.<sup>8</sup> Nor can they do away with (iii)

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<sup>7</sup> Thompson construes the "tight connection" between Grounding and metaphysical explanation as identity in the Unionist sense. As a result, this argument does not apply to Separatism.

<sup>8</sup> Perhaps I should rephrase "cannot" to be "should not." Hypothetically, Enthusiasts could motivate Grounding by finding theoretical work for it in places other than explanation, but the typical Enthusiast motivates Grounding by finding work for it in accounting for explanation.

because the work Grounding is purported to do requires it to be a worldly relation.<sup>9,10</sup> So, it appears that their best option is to reject (ii).

However, explanations do indeed seem to have agent-relative features. For example, some explanations seem to be sensitive to the contexts in which they are given. Suppose I am late to philosophy conference taking place at NYU and explain my tardiness by reference to the fact that I took the A train; since the A train does not stop near NYU's philosophy department, I had to walk several blocks until I reached my destination. However, my colleague does not know these details, so she therefore failed to receive an explanation for my tardiness. While my taking the A train might successfully determine the reason for my tardiness, my colleague did not receive an adequate explanation because it was not supplemented with the necessary contextual details.

Perhaps the Unionist could resist that example and insist that I failed to express that the explanans fully determined the explanandum; she might argue that whatever I communicated to her wasn't an explanation. Even if one is sympathetic to that response, there is a more compelling reason Unionism fails: explanations crucially involve understanding, and understanding is essentially phenomenological, and hence agent-relative, in nature. Anna-Sofia Maurin expresses this point well, saying:

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<sup>9</sup> Just what work Grounding is purported to do is multifarious, manifold, and controversial, and I do not have the space to full explicate those debates here. In short, Grounding has been used to account for the structure of reality, to show movement from the less fundamental to the more fundamental, to fruitfully express certain metaphysical theories such as naturalism, physicalism, and more. I believe it is highly unlikely that Grounding can successfully accomplish almost any of the tasks typically given to it if we understand it as mind-dependent.

<sup>10</sup> Here and throughout the paper, I refer to grounding as a relation. However, some believe the logical form of grounding is that of a sentential connective or a sentence-forming operator. No part of my argument will turn on how we understand the logical form of Grounding.

“Explanation is not just information. It is a function of the needs, knowledge, and expectations of those to whom the explanation is offered. It matters to (it ought to increase) the understanding of its (potential) receiver. Although it may or may not be understood as involving the obtaining of some worldly, mind-independent relation, therefore, explanation, most seem to agree, always involves something purely mind-dependent and epistemic” (Maurin 2018, 1580).

Explanations are used to convey, express, or articulate something about an objective state of the world. If I explain the shattering of the window through appeal to the fact that Susy threw a rock at it, then I am implicitly affirming that Susy exists and that she set the rock in motion. I am affirming that there are such things as windows and that windows can shatter; that there are rocks and that rocks have the ability to shatter windows; and that there is some sort of causal connection between all of these facts, properties, and objects. However, as Maurin argues, explanations are something over and above information about what the world is like; they are intimately involved with explanation-givers and -receivers. When an agent successfully receives an explanation, she has understood something about the world, and it seems natural to think that understanding is mind-involving and phenomenological in nature. But if explanations are mind-involving, that seems to imply that explanations are (to some degree) mind-dependent. But if, under the Unionist view, Grounding just is explanation, then there doesn't seem to be room for explanations to be mind-dependent. While some clever metaphysician could perhaps tease apart a distinction between mind-involvement and mind-dependence to avoid this problem, these objections have led many Enthusiasts to be Separatists about Grounding and explanation.

Refer back to Kim's formulation of what it is we know in virtue of having an explanation – the fact that there is some objective mind-independent relation  $R$  that holds between  $c$  and  $e$

explains the fact that C explains E. Cashing out the relationship between explanation and Grounding in this way quite clearly demonstrates that Grounding is NOT identical to explanation while demonstrating that there is a crucial link between explanation and Grounding; only by appealing to Grounding can we explain why C counts as an explanans for E. While the Unionist conflates explanation with Grounding, the Separatist maintains that they are two distinct notions. This raises an important question for the Separatists: If Grounding and explanation are distinct, how do we know that they are related at all? If Grounding and explanation are both distinct AND unrelated, then it would be unclear why the objective relation R holding between c and e explains why C explains E. With doubt cast upon both Unionism and Separatism, things are starting to get worrisome for the Enthusiast.

Criticisms such as these are typically packaged as arguments against Enthusiasm, but I believe these problems are not unique to those who posit a link between Grounding and explanation; rather, they should be understood as a problem for any theory of explanation. To borrow some terminology from discussions in the philosophy of science, we can understand explanations to be either ontic or epistemic. The ontic/epistemic distinction is comprehensive and mutually-exclusive, and it is most readily understood *what is an explanation?* Proponents of the epistemic conception (EC) will say that explanations are representations of objective, worldly phenomena, and EC theorists believe that successfully receiving an explanation will increase an agent's knowledge. Furthermore, since representations are not identical to the phenomena which they, well, represent, there is likely room for additional constraints to be put on explanations; these constraints might include all manner of things as understanding (in a phenomenological sense), context, or epistemic conditions relating to the closure of knowledge.<sup>11</sup> Since this view of

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<sup>11</sup> Exploration of the relationship between representations, phenomena being represented, and potential constraints on explanation is beyond the scope of this thesis.

explanations distinguishes between representations and the phenomena which they represent, the Separatist will likely be a friend of the epistemic conception.

Meanwhile, the Unionist ought to be a friend of the ontic conception (OC) of explanations. The OC theorist believes that explanations are not things that can be true of false; rather, they are entities that causally participate in the structure of the world (Wright and van Eck 2018, 999).<sup>12</sup> Representations play no role in the OC theorist's account of explanation because she believes explanations are a part of the world instead of a representation of it, and taking that position, of course, opens the OC theorist up to similar. My purpose for discussing the ontic/epistemic conception is not to argue for one view over another (although I do tend to favor the epistemic conception); instead, I hope to show readers that this debate is one about explanation in general rather than the merits of Enthusiasm.<sup>13</sup>

## 2.4 Skepticism and the Argument from Indispensability

With Unionism dispatched, the debate between Sceptics and Enthusiasts then shifts to what to identify as relation R that holds in explanations. The Enthusiast maintains that since Grounding is an inherently explanatory notion, it is the best and only candidate to function as R. Still, the Sceptic could ask why this special, explanatory relation *must* be Grounding and insist that she still has adequate resources to account for explanation without it.

One prominent Sceptical counterview to Separatism was developed by Jessica Wilson (Wilson 2014). Wilson argues that we need not posit Grounding; there are already an abundance

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<sup>12</sup> 'Causally' in this context refers to metaphysical determination of the synchronic variety (although see footnote 5 about the distinction between causal and non-causal determination).

<sup>13</sup> In the rest of this thesis, I will talk of explanation being true of false rather than actual or not actual (which is what explanations are under OC). I will also frame the debate between Enthusiasts and Sceptics as a dispute over what backs the objective relation R that holds between c and e, but nothing hinges on this and everything can be duly rephrased if the ontic conception turns out to be the best theory of explanation.

of metaphysical dependence relations in metaphysics – relations which include, but are not limited to, mereological composition, set-membership, the determinate-determinable relation – and these relations are put to good work. All that is needed to show dependence are these relations. While the Grounding theorist argues that these dependence relations all have something in common, the Skeptic denies that this is so. In fact, one might have the opposite intuition; she might think that there isn't anything in common between these relations. After all, what could set-membership have in common with mereological composition? Wilson should be understood as a pluralist about dependence; there are multiple dependence relations, not just Grounding, and we can make do simply by appealing to them.

The Enthusiast might reply that Grounding is crucially needed to express the direction of dependence in certain metaphysical explanations. For example, in every possible world that Socrates exists, {Socrates} exists as well. But the fact that there is a set-membership relation holding between Socrates and {Socrates} does not reflect any sort of dependence or priority. Sets depend on their members; members are *prior* to their sets. However, informing me simply that Socrates stands to {Socrates} in a relation of set-membership does not inform me which relatum is prior to the other.

It may be tempting to appeal to relations such as necessitation or supervenience to account for explanations such as SOCRATES. By utilizing necessitation, perhaps we can adapt SOCRATES as follows:

SOCRATES<sub>Necessitation</sub>: That Socrates exists explains why {Socrates} exists because Socrates necessitates {Socrates}.

SOCRATES<sub>Necessitation</sub> says that in every world where Socrates exists, {Socrates} exists as well. In this way, the existence of Socrates necessitates the existence of {Socrates}, so the truth of the proposition <Socrates exists> explains the truth of the proposition <{Socrates} exists>. However, this will not do. SOCRATES<sub>Necessitation</sub> is false because necessitation is not inherently explanation. To see why, consider:

{SOCRATES}<sub>Necessitation</sub>: That {Socrates} exists explains why Socrates exists because {Socrates} necessitates the existence of Socrates.

But {SOCRATES}<sub>Necessitation</sub> is clearly not true since we understand sets to depend on their members; the existence of {Socrates} does not explain the existence of Socrates. As a result, simply identifying the objective backing relation R as necessitation does not suffice for metaphysical explanations. Rather than being an explanatory notion that tracks dependence, necessitation is only a modal notion and thus cannot account for the direction of priority in cases like SOCRATES.

Enthusiasts often use this argument to motivate Grounding, but the Skeptic has a strategy that avoids this worry. The Skeptic will agree that necessitation *tout court* is not suited to specify the direction of priority in cases like SOCRATES<sub>Necessitation</sub> but simply supplement this case with a statement about which of the relata is more fundamental. Thus, SOCRATES could be reworked into the following:

SOCRATES<sub>more-fundamental-than</sub>: That Socrates exists explains why {Socrates} exists is true because Socrates is more fundamental than {Socrates}.

And this seems to go through. The upshot of this is that the Skeptic may suitably account for metaphysical explanations by jointly identifying R as one of the various non-Grounding relations and specifying which of the relata is more fundamental to fix the direction of priority. The Skeptic doesn't deny that the Enthusiast can account for metaphysical explanation; instead, she denies that the *only* way of accounting for metaphysical explanation is by being a Separatist.

In this thesis, I will motivate Grounding through what I call the Argument from Indispensability:

### **Argument from Indispensability**

- (i) If Grounding is indispensable to a successful account of metaphysical explanation, then we ought to posit Grounding.
- (ii) Grounding is indispensable to a successful account of metaphysical explanation
- (iii) Therefore, we ought to posit Grounding.

The Skeptic's position is to deny (ii) because there are alternative ways of accounting for a successful theory of metaphysical explanation. However, in chapter three I will argue that (ii) is in fact true and proceed to posit that there is some unified notion of dependence called Grounding.

And with that, I close the section on what needs to be done to properly motivate Grounding. In the following section, I will explain that Grounding does perform important work in our explanations and that it cannot be substituted by other metaphysical dependence relations. I will do this by showing how three features of explanations can be accounted for by reference to three features of reality's structure.

## **Chapter 3:**

### **The Structure of Reality**

This chapter is composed of three sections which describe three features of certain kinds of explanation. Insofar as we understand these features to be metaphysical (as opposed to epistemic) in nature, these features will function as desiderata for a theory of explanation. I will then argue that for each of these three features there is a corresponding desideratum for a theory of structure; further, I will argue that these features of explanation are best understood in terms of these features of structure. Finally, I will explain how only an Enthusiast view of Grounding can accommodate both the explanatory desiderata and the structural desiderata.

#### **3.1 Fundamentality and Dependence**

In this section, I will begin by describing the principle of Dependence as it features in metaphysical explanations. Then, I will identify the corresponding structural desideratum – Univocality – and distinguish between two ways of understanding the Skeptic’s account of metaphysical explanation. The first way of understanding the Skeptic’s account is what I call Particularism, but Particularism has unacceptable consequences. The second way of understanding the Skeptic’s account is what I call Pluralism, but I argue that Pluralism either 1) collapses into a form of Enthusiasm or else 2) fails to satisfy Dependence.

Explanations can be understood as conveying facts about dependence. More specifically, in a given explanation, the explanandum depends on the explanans in a uniquely explanatory way. It is not enough for the explanans to necessitate the explanandum in order to show

dependence; such was the lesson from {SOCRATES}<sub>Necessitation</sub>. Here is a formulation of this principle:

Dependence: In a given successful metaphysical explanation, the explanans asymmetrically depends on the explanandum.

What I have in mind by ‘asymmetrically depends’ is the primitive notion of dependence at work in SOCRATES. If Dependence was not true, then that would imply that confounding cases such as {SOCRATES}<sub>Necessitation</sub> could be admissible as explanations. Neither the Enthusiast nor the Skeptic finds that acceptable, so I won’t either. As a result, I will assume that Dependence is required for a successful theory of explanation. Next, consider the following comparisons dealing with relative fundamentality:

TABLE<sub>priority</sub>: A group of carbon atoms are prior to the table that they compose.<sup>14</sup>

TABLE<sub>priority</sub> appears to be true. Enthusiasts would account for this case by saying that the table (a whole) is grounded in its parts (the carbon atoms). In contrast, the Skeptic would say that the relation of mereological composition holds between the table and the carbon atoms and, in order to account for the direction of priority, supplement this with the statement that the carbon atoms are more fundamental than the table. So far so good.

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<sup>14</sup> By ‘prior,’ I mean to say that the table asymmetry depends on its carbon atoms.

TABLE<sub>parts</sub>: A group of carbon atoms are more fundamental than table parts they compose (i.e. the table-legs, the table-top, etc.) as well as the table taken as a whole.

TABLE<sub>parts</sub> is saying that there is a table whose constituents include carbon atoms and macroscopic parts such as screws, nuts, table-legs, and any other ordinary object that went into making the table; furthermore, TABLE<sub>parts</sub> affirms that the carbon atoms are prior to both the table (the whole) and its composite macro-parts. I tend to think TABLE<sub>parts</sub> is true, though some philosophers disagree. TABLE<sub>parts</sub> assumes that parts are more fundamental than wholes, but this conflicts views such as priority monism which holds that wholes are actually prior to their parts (Schaffer 2010).<sup>15</sup> Whichever style of theory you prefer – wholes are more fundamental than parts, or that parts are more fundamental than wholes – is not particularly important for my purposes; my point in using TABLE<sub>parts</sub> is to demonstrate that our fundamentality talk is univocal.<sup>16</sup> Note that priority microphysicalism (the thesis that wholes depend on parts) implies not only that the carbon atoms are more fundamental than the table, but also that they are more fundamental than the table-parts. Some (such as Johnathan Schaffer) may disagree that this is true, but I believe very few would say that TABLE<sub>parts</sub> is incoherent. As long as the statement itself is coherent, then that implies that our talk of fundamentality is univocal. Let's define this concept:

Univocality: There is only one unified notion of Fundamentality.

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<sup>15</sup> This characterization of priority monism is a bit too simplistic. More specifically, priority monism holds that the only whole is the whole cosmos, and that each of its parts depends on the cosmos-whole.

<sup>16</sup> From now on, I will be talking as if parts are more fundamental than wholes in order as I express the argument. But nothing turns on this, of course, and readers can easily enough rework these examples in the opposite direction as they prefer.

What would denying Univocality amount to? If one believes that statements such as  $TABLE_{\text{parts}}$  are incoherent because they conflate different notions of fundamentality, then that implies they think fundamentality is to some degree polysemous, which is to say that there are many distinct notions of fundamentality. Consider the following:

**METAPHYSICS:** Metaphysics is harder than diamonds.

**METAPHYSICS** strikes me as false. Metaphysics is indeed hard, and diamonds are also hard, but these things are hard in two different senses of the word. Metaphysics is hard, but we would never subject it to a Vickers test. As a result, making a hardness comparison between metaphysics and diamonds is a category mistake. Likewise, some may reject  $TABLE_{\text{parts}}$  on the basis that the comparison involved is not applicable since fundamentality is polysemous. But this view strikes me as implausible. Firstly, parthood is transitive. If  $x$  is a part of  $y$ , and  $y$  is a part of  $z$ , then  $x$  is a part of  $z$ .<sup>17</sup> But if we understand parthood to be transitive, and understand that there is a dependence relation at work in each case of the parthood relation (as the Skeptic does), then we should endorse  $TRANSITIVITY_{\text{Fundamentality}}$ :

$TRANSITIVITY_{\text{Fundamentality}}$ : If  $x$  is more fundamental than  $y$ , and  $y$  is more fundamental than  $z$ , then  $x$  is more fundamental than  $z$ .

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<sup>17</sup> It might be that parthood is not transitive *tout court*; perhaps a part of a part of part... will eventually fail to be part of the original whole. But I would sooner say that parthood is transitive within certain constraints than affirm that parthood is *not* transitive.

Since y is part of z, then y depends on z. But since x is a part of y, then x must also be said to depend on z. The upshot of  $\text{TRANSITIVITY}_{\text{Fundamentality}}$  is that we are working with a univocal notion of fundamentality. However, if fundamentality is not univocal, then we are committed to  $\text{NOT-TRANSITIVITY}_{\text{Fundamentality}}$ .

However, the Skeptic may account for x's depending on z without endorsing a univocal fundamentality. The move here would be to say that while the same mereological parthood predicate is operating on x, y, and z (hence conferring a univocal sense of parthood in this case), these three things are not related by the same more-fundamental-than predicate. That does not commit the Skeptic to denying that x is not more fundamental than (z & y). Instead, she could assert something to the effect of "fundamentality happens at the level of facts" and say that x has the property of being more fundamental than y, y has the property of being more fundamental than z, and x has the property of being more-fundamental-than in three ideologically distinct ways.

The problem with this strategy is that it commits us to a notion of fundamentality that is too particular. Why? Because that is just what it means to deny that the same predicate is operating on a series of relata.

Particularism: The view that Fundamentality is thoroughly particular; that there is no sense in which fundamentality is a unified concept.

In the Particularist system, x bears the more-fundamental-than relation to y, and y bears the more-fundamental-than relation to z, but the Particularist would deny that y lies in the ancestral of the more-fundamental-than relation holding between x and z.

In this case, this Skeptic would be committed to Particularism about fundamentality, and Particularism is unattractive even at the best of times. Firstly, Particularism posits a very large number of primitive predicates and would greatly expand the inventory of our ideology; this is not in any regard a parsimonious view. Further, Particularism is simply unintuitive. It posits that reality has a flat structure because everything stands in one Particular more-fundamental-than relation away from everything else. Finally, the view is simply arbitrary and ad hoc. I don't understand why anyone would want to be a Particularist, and it strikes me as a position of last resort. I can understand the concerns of those who are reluctant to embrace a univocal fully fundamentality, but I don't imagine anyone would find Particularism more palatable.

Particularism is one way of understanding how the more-fundamental-than relation works, but I doubt the Skeptic has a Particularist view in mind when she employs this relation in her theory of dependence. Instead, the Skeptic likely thinks that fundamentality is univocal but only when indexed to particular dependence chains. A dependence chain is a group of facts, properties, or objects which are linked together through a series of metaphysical dependence relations. The carbon atoms, for example, constitute the table-parts, and the table-parts constitute the table-whole; since constitution is a relation of metaphysical dependence, I refer to the linkage between the carbon atoms, table-parts, and the table-whole as a dependence chain. An indexed – hence plural – notion of fundamentality is able to accommodate an indexed version of relative fundamentality and is thereby able to avoid the pitfalls of Particularism.<sup>18</sup>

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<sup>18</sup> It's important to distinguish between understanding fundamentality as plural compared to understanding it as coming in flavors. A pluralist about fundamentality thinks that dependence is unified within particular dependence chains; I think of the debate about pluralism to be a debate about the degree to which dependence is unified. Meanwhile, the theorist who thinks that fundamentality comes in flavors thinks that there are multiple different types of fundamentality. See section 4.2 for a fuller discussion about how we might understand fundamentality to come in flavors. In this thesis, I am mainly concerned with the degree to which dependence is unified, and I think it's likely a unified notion of dependence is compatible with a flavored view of fundamentality. I do not have further space to explore this topic, but what is meant by a unified notion of dependence should become clearer as readers progress through chapters 3 and 4.

Pluralism: Fundamentality is univocal insofar as it is indexed to particular dependence chains.

On the Pluralist's account of metaphysical explanation, absolute fundamentality must be understood as a primitive notion. If a concept is primitive, that means it is not explicable in more basic terms; it is a rock-bottom feature of reality.<sup>19</sup> Wilson's account of metaphysical explanation requires absolute fundamentality to be a primitive notion because defining it in more basic terms commits us to a form of unified dependence. To see why, consider the implications of defining absolute fundamentality in negative terms: The absolutely fundamental is that which does not depend on anything else. Under this definition, we can understand dependence in two ways. First, we can understand dependence to be Particular, but that carries over all the burdens associated with Particularist views. On the other hand, we can understand dependence to be unified, but this unified notion of dependence seems to be just what the Enthusiasts say Grounding is.

In a sentence, Pluralism is a version of Skepticism that utilizes a unified more-fundamental-than relation that is indexed to particular dependence-chains with a primitive, positive view of fundamentality. Under this approach, the Pluralist can affirm the coherence of claims like  $TABLE_{\text{parts}}$ , thereby implying that a univocal more-fundamental-than relation is at play when comparing the relative fundamentality of the carbon atoms, the table-parts, and the table-whole.

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<sup>19</sup> How we access primitive concepts is an interesting question that has not been the subject of much investigation; a common strategy is motivate the primitive by using explanation by analogy or perhaps demonstrate how the primitive works in paradigm cases. It's possible some readers might be skeptical of the view that absolute fundamentality is a primitive concept because they are skeptical of primitive concepts in general. If a concept is primitive, how can we come to know what it is? I would consider making this sort of argument myself, but the Enthusiast has a similar problem; they often hold Grounding to be primitive as well.

Is there any harm in accepting a univocal more-fundamental-than relation for the Skeptic? I believe so; the more-fundamental-than relation *is* the Grounding relation. Consider Bradley Rettler's description of the work performed by Grounding:

"As a first pass, the job description for the grounding role is something like: relates the fundamental to the nonfundamental, relates the relatively more fundamental to the relatively less fundamental, lays out the structure of the world, says which things depend on which other things, explains why something exists, and explains why something has a property." Rettler 2017, 644.

In order to avoid confounding cases like {SOCRATES}<sub>Necessitation</sub>, Wilson accounts for the direction of priority in cases like SOCRATES by specifying which of the relata is more fundamental (Wilson 2014, 558). This means the Pluralist uses fundamentality to do all of the explanatory heavy lifting and thus employs the more-fundamental-than relation (where we understand this relation to be unified across dependence chains). However, this is what the Enthusiast means by asserting that there is a Grounding relation.

"Not so fast," the Skeptic might say, "There is a substantive difference between the more-fundamental-than relation and Grounding because while the latter commits us to defining fundamentality in more basic terms, the former doesn't. Hence, by Leibniz's Law, they are not the same."

However, it is doubtful that the Pluralist can utilize the more-fundamental-than relation without defining fundamentality in more primitive terms. According to Pluralism, absolute fundamentality, like Grounding, is a primitive notion. If there are indeed absolutely fundamental entities (perhaps quarks are one of them), then they are identified by inspecting them and

identifying that as the positive feature that they have – absolute fundamentality. Of course, it is an open question whether absolutely fundamental entities (let's call these entities Positives) exist, but let's grant for the moment that they do. Now, consider that working with a primitive notion of absolute fundamentality doesn't rule out that there are also entities that don't depend on anything else (let's call them Independents). But suppose I ask The Question: Is the class of Independents the same as the class of Positives? Suppose that we answer in the affirmative. There are two ways of understanding what this entails.

First, suppose that the class of Independents is coextensive with the class of Positives because being-an-Independent and being-a-Positive is the same property. If that is the case, it appears that we have therefore defined fundamentality in more basic terms. To see why, let's see how this works with more familiar properties:

BACHELOR: The property of being a bachelor.

MALE<sub>unmarried</sub>: The property of being an unmarried male.

Consider that being an unmarried male is the same property as being a bachelor; there are simply two ways of describing this property. However, bachelorhood is not a primitive concept; instead, we can define this property in more basic terms – being an unmarried male. In this sense, reductions are *informative*. If I did not know what a bachelor is, someone could convey this concept to me by describing it as unmarried-maleness. If this is the case, then it appears that bachelorhood is not a primitive concept since it can be defined in more basic terms. However, could the opposite be true instead? Could the concept of being an unmarried male be defined in terms of bachelorhood? The move here is to argue that, hypothetically, if I didn't know what it

means to be an unmarried male, but I did know what it means to be a bachelor, then someone could convey  $\text{MALE}_{\text{unmarried}}$  to me by informing me that it is the same property as BACHELOR. In this sense, one might argue that bachelorhood is in fact the primitive concept. This reason this move doesn't work is because I still wouldn't have been able to grasp BACHELOR *if I didn't already know what it means to be an unmarried male*. Think of it this way: bachelorhood is a conjunction of the two distinct properties being-male and being-unmarried. If I didn't know either what it means to be male or what it means to be unmarried, then there would be no way for me to understand bachelorhood. I take this to mean that  $\text{MALE}_{\text{unmarried}}$  is in some sense prior to BACHELOR in that the latter can be informatively reduced to the latter, but not vice versa. Similarly, I can come to apprehend the property being-a-Positive by being informed that it is the same property as being-an-Independent. In this case, we can understand the property being-an-Independent as the conjunction of a several others (not depending on  $x_1, x_2, x_3\dots$ ). As a result, if being-a-Positive is the same property as being-an-Independent (which is understood as a conjunction), then the former is reductively defined in terms of the latter.

Finally, as discussed earlier, we can understand dependence to be Particular or we can understand dependence to be unified. Particularism is unacceptable, so we ought to understand dependence as unified. However, if we understand dependence as unified, then we have just endorsed Enthusiasm.

Now let's consider a negative answer to The Question, which is to say that being-an-Independent and being-a-Positive are distinct properties. You might think that it isn't problematic that the class of Independents is coextensive with the class of Positives. After all, triangularity is not the same property as trilaterality even though the set of triangular entities is coextensive with the set of trilateral entities. However, this is still a problem for the Pluralist. If

being-an-Independent and being-a-Positive are distinct properties, then distinct predicates are required to assign these properties to the entities that have them. If this is true, then that demonstrates that the direction of dependence cannot be accounted for simply by identifying which of the relata in a small-g dependence relation is more fundamental. This is a problem for the Pluralists. Recall that the Pluralist strategy for accounting for the direction of priority in cases like SOCRATES was to specify which of the relata (Socrates and {Socrates} in this case) is more fundamental. However, if fundamentality and dependence are ideologically distinct concepts, then merely informing me which relatum is more fundamental than the other does not tell me which depends on the other, and this makes Pluralism vulnerable to confounding cases such as SOCRATES<sub>Necessitation</sub> and {SOCRATES}<sub>Necessitation</sub>.

In summary, the Skeptic has two options. First, she might endorse Particularism, but that view is untenable. Second, she might endorse Pluralism, but Pluralism (as it was defined in this section) collapses into a form of Enthusiasm. As a result, we can either be Particularists or Enthusiasts. Given the choice between the two, I think we should be Enthusiasts; however, I have written two more sections of this chapter just in case my reader is still on the fence.

### **3.2 Distance and Proximity**

In this section, I will describe the explanatory principle of Distance and explain its connection to the structural desideratum of Proximity.

Rather than starting with a formal definition of Distance, I prefer to demonstrate it in action with an intuitive example:

SUSY<sub>Big Bang</sub>: In a causally deterministic universe, the window shattered because of the Big Bang.

In the universe mentioned in SUSY<sub>Big Bang</sub>, all events were fixed and determined from the start of the Big Bang. That means if one possessed a full enough knowledge of physical laws and the initial set of circumstances in this universe, they would be able to accurately predict in advance that Susy would eventually come to throw the rock and shatter the window. Still, it doesn't seem quite accurate to say that SUSY<sub>Big Bang</sub> is true. The Big Bang causally necessitated the shattering of the window, but is it true that the window shattered *because* of the Big Bang? Does the occurrence of the Big Bang successfully explain why the window shattered? I don't think so. It seems that while the explanans in this case causally necessitated the explanandum, the explanans is too distant from the explanandum to be explanatorily efficacious. This is a loose formulation of this principle:

Distance: Explanations are liable to fail even in cases where the explanandum depends on and is necessitated by the explanans.

I take Distance to be a feature of reality, and if we understand the phenomenon of Distance to be objective in nature, then our best theory of explanation should be able to account for it.

One objection to this line of argument might hold that SUSY<sub>Big Bang</sub> fails to be an explanation not as a result of Distance, but rather as a result of underdetermination; the explanans fails to necessitate the explanandum. If we were capable of fully comprehending the

requisite knowledge of physics and mathematics and possessed sufficient cognitive processing power to plug these laws and conditions into the mathematical calculus, perhaps the Big Bang would count as an explanation for why the window shattered. In this sense, as the objectors argue, the Big Bang doesn't count for *us* as an explanation, but that's only as a result of a sort of underdetermination. Since we don't possess a full enough knowledge of the physical circumstances surrounding the Big Bang, we wouldn't be able to feature it as the explanans for the explanandum because we wouldn't know whether the Big Bang entails that the window will shatter.

A second objection to this example might be to say that Distance is merely an epistemic feature of explanations. Take SUSY, for example. Strictly speaking, it might be the case that Susy did not cause the window to break. Rather, it is the fact that the rock struck the window at a certain velocity and that window had the property tends-to-break-when-struck-by-rocks that caused it to break. Susy may have caused the rock to travel through the air at a certain velocity, but only the rock is explanatorily relevant; all the evidence to the contrary (i.e. any intuitions we have that *Susy* caused the window to shatter) could be explained away as being epistemic in nature. Consider ROCK, which is another potential explanation for why the window broke:

ROCK: The window broke because it was struck by a rock.

For individuals in a certain epistemic situation, such as the Homeowner of the broken window, SUSY is true; the Homeowner is concerned with who to blame for the breaking of the window, so they want to find the agent responsible for throwing the rock. For the scientist, SUSY is likely to be false while ROCK is likely to be true. That is because the scientist is interested in studying the physical properties of the rock and the window and is less concerned

with the agent who set these events in motion. SUSY and ROCK show is that Distance reflects the epistemic needs of the explanation-seeker; however, if that is true, if Distance is merely an epistemic phenomenon, then Distance is an epistemic or agent-relative feature of explanations rather than an objective feature. And, if that was the case, we wouldn't be expected to account for it as an objective feature of reality.

I believe both of these objections can be answered by the same response.

EVENT: The window shattered.

EVENT was preceded by a number of causes; there was the first cause  $C_1$ , followed by  $C_2$ ,  $C_3$ ... eventually resulting in  $C_n$  which is the closest cause in proximity to the shattering of the window. These causes are all objective features of reality.

However, suppose were we to remove one of these features in the causal-explanatory chain, such as  $C_n$ . If  $C_n$  ceased to be a feature reality, then that would imply that for the Scientist, EVENT is unexplained. If  $C_{n-1}$  was excised from the causal chain, then EVENT would be unexplained for the Homeowner.<sup>20</sup> The ramifications of this are non-trivial; Distance is a feature of reality, not merely an epistemic feature of explanations. That a particular agent needs to receive an explanation indexed to a particular node in the causal-explanatory chain might be an epistemic or agent-relative matter, but that does not mean Distance should not be understood to be a feature of reality.

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<sup>20</sup> In this example,  $C_{n-1}$  is the fact that Susy caused the rock to possess the physical properties required to strike the window and break it.

My reader might have noticed that I used causal explanations to motivate Distance. However, seeing how this is a thesis about metaphysical explanations, it's worth showing Distance at work in explanations of those variety.

TABLE: The table has the property of being brown, wooden, and hard.

In this case, the metaphysical explanation we are seeking is one that informs us why the fact TABLE obtains. Specifically, suppose the explanation-seeker is an interior designer. The interior designer wants an explanation that appeals to facts about the wood that was used to construct the table; facts about the veneer that was used to cover the wood; and an assortment of other facts whose constituents involve ordinary macroscopic objects that went into the making of the table. I expect an explanation of this sort to satisfy the interior designer, but not the Scientist. The Scientist seeks an explanation that appeals to facts about the properties of the Table's microscopic constituents. If we understand TABLE to be an explanandum, we would say that the explanans that involves an appeal to microphysical properties is more distant than the explanans that involves an appeal to the properties of the table-parts.

I believe Distance is best understand in terms of the structural feature Proximity:

Proximity: Each entity in a dependence chain bears to each other entity located on this chain a unique degree of relative fundamentality except in cases of equifundamentality.<sup>21</sup>

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<sup>21</sup> Proximity makes the assumption that fundamentality (at least as it is indexed to particular dependence chains) comes in degrees. While I think this notion has *prima facie* plausibility, I will not defend it here. Also, the last part of this formulation required an exception-clause to avoid a counterexample. Suppose x is relatively fundamental to y by degree m. If y is equifundamental to z, then x must also bear degree m to z.

Essentially, what Proximity is after is an account of relative fundamentality. Formulating a definition of relative fundamentality is bound to be a messy affair, but luckily we already have a working model for it.

(MFT)  $x$  is more fundamental<sub>R</sub> than  $y =_{df}$  either

- (1)  $x$  is fewer grounding steps away from the fundamental entity(ies) that terminate its unique chain than  $y$  is from the fundamental entity(ies) that terminate its unique chain, or
- (2)  $x$  at least partially grounds  $y$ , or
- (3)  $x$  stands in the ancestral of a grounding relation to  $y$ , or
- (4)  $x$  is absolutely fundamental and  $y$  is not, or
- (5)  $x$  belongs to some kind  $K$  and  $y$  belongs to some kind  $K^*$  such that
  - a. neither  $K$  nor  $K^*$  includes both grounded and ungrounded members, and
  - b.  $y$  does not belong to  $K$  and  $x$  does not belong to  $K^*$ , and
  - c.  $K^*$ s are typically or normally grounded from  $K$ s (Karen Bennet 2017, 161).<sup>22</sup>

This is admittedly quite a complex definition, and, as Bennett remarks, complex definitions beg to be counterexamined. This formulation of relative fundamentality also contains some potentially controversial assumptions, such as that relative fundamentality is indexed to specific Grounding relations. However one wants to cash out relative fundamentality is not crucially important for our purposes; the central point here is that Bennett's definition of the more-fundamental-than relation succeeds in accommodating Proximity.

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<sup>22</sup> In *Making Things Up*, Bennett refers to what I have called Grounding and "Building" and formulates (MFT) in terms of Building. Here I have reproduced (MFT) using the more familiar Grounding idiom.

Why should we understand Distance as a function of Proximity? Let's return to an example of Distance at work in a metaphysical example. Imagine that we were to conceptualize TABLE as a function of a dependence chain: the properties mentioned in TABLE can be accounted for by reference to the table's macro-parts, these macro parts can be accounted for in terms of its chemical properties, and its chemical properties are further determined by the table's microphysical properties. Further, the physical properties are able to fully account for both the chemical properties, the properties of the table's macro-parts, and the properties of the table-whole. While the chemical properties can do the same (except accounting for the physical properties), only by utilizing some univocal form of dependence can we construct an account of relative fundamentality that is able to locate the physical properties farther away in proximity than chemical properties in relation to the table-whole. The principle of Distance left us with something of a mystery: if necessitation and dependence isn't enough for an explanation, what is? After examining the cases dealing with the scientist and the homeowner, I think there is a clear answer to this question – in a given explanation, each explanans must cite a fact of the right proximity away from the explanandum. It should also be noted that since Particularism posits a flat structure, relative fundamentality turns out to be rather binary. The Particularist notion of relative fundamentality does not come in degrees; while an object might only be more or less fundamental to another object, Particularism is simply not equipped to deal with questions of magnitude. The structural implications of Particularism are quite unintuitive, and that is enough for me to reject the view; however, if we understand Distance to be a function Proximity, then Particularism is also unsuited to support a successful theory of explanation.

### **3.3 Unification and Layers**

In this section, I will describe the last feature of explanations and explain its connection to a feature of structure.

In section 3.1, argued that Pluralism collapses into either Particularism or Enthusiasm. However, that might not be quite accurate. It might be possible to modify Pluralism to tread a middle ground between Enthusiasm and Skepticism. Let's call this view Pluralism(-).

Pluralism(-): For any given dependence chain where  $x$  depends on  $y$ ,  $y$  depends on  $z$ ,  $z$  depends on ... there is a general, unified form of dependence.

To use a mereological example to demonstrate how Pluralism(-) works, consider that a cat – let's call him Tom – has a nose. A nose is one of Tom's parts; further, one of the cells comprising Tom's nose is a part of a part. But this cell is also a part of Tom. If we understand that there is some sort of dependence involved between Tom and his nose, and his nose and one of its constituent cells, then we would say that this form of dependence is unified only along Tom's specific dependence chain; at each place where there is a mereological dependence relation between Tom and one of his parts, or between one of his parts and a part of that part, there is also some unified notion of dependence. Let's call this dependence relation the  $\text{Tom}_{\text{cat}}$  relation. Now, imagine that there is another cat named Fat, and Fat also has a nose, has a cell that is part of his nose, etc. The Pluralist(-) will maintain that there is also some unified notion of dependence at work in the case of Fat. Let's call this relation  $\text{Fat}_{\text{cat}}$ . While there is some unified form of dependence, it is localized to each specific dependence chain. After all, the relation  $\text{Tom}_{\text{cat}}$  is not the same one as  $\text{Fat}_{\text{cat}}$ . Finally, since there is an indexed form of unified

dependence, there is also an indexed notion of absolute fundamentality which is defined in negative terms.<sup>23</sup>

Pluralism(-) is worth considering as alternative to Enthusiasm because it is able to satisfy all of the explanatory and structural desiderata described in sections 3.1 and 3.2. Since it employs a unified notion of dependence, it is able to avoid Particularism while accommodating Dependence and even Univocality to some degree. Further, the individual dependence chains are structured in such a way that they are able to accommodate Proximity, and that implies that they are able to account for Distance. So far, this view is looking like a viable theory of explanation; however, I will show that it cannot accommodate the final pair of desiderata.

Back in section 3.2, I implicitly assumed that the properties of more fundamental entities “trickle up” to the properties of entities higher up in the hierarchy within a dependence chain (e.g. chemical properties determine the properties of the table-parts while physical properties account for the nature of those chemical properties). To borrow a term from Tobias Wilsch, this phenomenon is explained by the principle of INHERITANCE:

INHERITANCE: Properties of constructed entities are determined by properties of their constituents (Wilsch 2015, 3296).

Perhaps a more familiar way of articulating INHERITANCE is to say that the more fundamental determines the properties of the less fundamental. To reject this principle is to accept something akin to INHERITANCE<sub>Backwards</sub>.

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<sup>23</sup> In fact, that is why I added the (-) after 'Pluralism' - because absolute fundamentality is defined in negative terms.

INHERITANCE<sub>Backwards</sub>: Properties of constituent entities are determined by properties of the entities which they construct.

INHERITANCE<sub>Backwards</sub> states that the properties mentioned in TABLE are not determined by its constituents; rather, the properties of its constituents is just matter-of-factly determined by the properties of the table. Earlier, we explained why the table was hard, brown, and wooden by appeal to either its constituent macro-parts or its constituent micro-parts, but INHERITANCE<sub>Backwards</sub> states that this was a mistake; instead, this principle asserts that the properties of the Table-whole somehow determine, and hence are explanatorily prior to, its constituents.

I believe the clearest articulation of why INHERITANCE<sub>Backwards</sub> is false is because many of the Table's properties are likely what David Kovacs calls aggregative cluster concepts (Kovacs 2018). 'Bigger than,' for example, is best characterized as an aggregative cluster concept because it is the result of a complex weighing of numerous other properties such as mass, weight, size, etc. Likewise, perhaps what it is to be 'hard,' or 'brown,' is a function of a set of more fundamental properties that are possessed by entities lower down on the dependence-chain.

One who rejects INHERITANCE<sub>Backwards</sub> is likely to argue that no matter how we understand derivative properties (properties which aren't fundamental) such as being-wooden or being-hard, they simply aren't able to determine more fundamental properties such as having (-)1 charge or spin. The general upshot of this is to endorse what I call Unification:

Unification: For a given explanation, certain categories of facts are metaphysically ineligible to feature as the explanans for a given explanandum.

It is not possible to explain the chemical properties of the table mentioned in TABLE by citing the fact that the table is hard, wooden, and brown. These properties are derivative and the chemical properties are simply more fundamental; the derivative is not able to explain the relatively more fundamental. To attempt to do so would be to cite the explanans and the explanandum out-of-order. Next, let's apply the principle of Unification to Pluralism(-).

There are two ways to understand what features reality would have if Pluralism(-) were true. On the first understanding, the Pluralist(-) reality would look just like ours. Chemical facts cannot ever explain physical facts, and social facts cannot ever explain chemical facts. However, consider that in Pluralism(-), fundamentality, and dependence are localized to particular dependence chains. If this was the case, there would be an unexpected degree of continuity between the structure of those chains. If there is no unified form of dependence, why do the chemical facts *always* depend on the physical facts? Why is it that social facts can *never* explain chemical facts? The Pluralist(-) does not posit a coarse-grained, general form of dependence; if she did, we could answer those questions by saying that chemical facts depend on physical facts, biological facts depend on chemical facts. However, the Pluralist's(-) system only maintains that this *particular* physical fact explains that *particular* chemical fact. As a result, it seems to be a coincidence that there is so much continuity between these disparate dependence chains. In essence, she has no way of explaining why Unification is true.

On the second way we can understand a reality that operates according to Pluralism(-), Unification is false. In particular dependence chains, social facts do explain chemical facts. In

other dependence chains, the facts of fundamental physics turn out to be derivative. The reason that this would be metaphysically possible under Pluralism(-) is because nothing unifies each ontological category across particular dependence chains; there are only particular forms of unified dependence. If that is the case, there is nothing to keep INHERITANCE<sub>Backwards</sub> from being false since what types of facts or properties can supervene on others is more-or-less random.

As a result, a successful theory of explanation should be able to explain why Unification is true of explanations. Unification is an explanatory principle, but I believe it can be best understood as a result of a structural principle:

Layers: Reality is partitioned into levels in some mind-independent, objective sense.

Layers is to affirm an intuitive structural principle, and it is easy to see how Unification and Layers are interconnected. Speaking strictly of ontology, we take there to be entities that are biological in nature (e.g. cells, organelles, horses, anything else which is the proper study of biology), chemical kinds (molecules, atoms), and those entities which are studied by fundamental physics (electrons, protons, quarks). Further, it seems intuitive to say that these kinds are more or less fundamental than each other. There are entities we take to be even less fundamental than biological kinds, and these are the things named in disciplines such as economics, psychology, sociology, and others. Finally, there are the entities which seem to be less fundamental still such as our socially constructed categories, fictional kinds, and any derivative entities which reside *in extremis* in funky worlds.<sup>24</sup>

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<sup>24</sup> It's not particularly important that my reader agrees which of these categories are more or less fundamental than some other specific category. Are economic kinds more fundamental than political kinds? Are fictional characters

Notice that Unification and Layers are intimately connected. For example, consider that physical facts can explain biological facts, and biological facts can explain sociological facts. It might be the case that certain classes of relatively more fundamental facts cannot explain certain classes of relatively less fundamental facts – such as appealing to the properties of physical properties of atoms and molecules to explain the properties of fictional characters – without being mediated through some intervening facts in the middle.<sup>25</sup> It should be clear, however, that less fundamental facts are not of the right kind to explain the more fundamental; we would never replace the physicists doing research at CERN with sociologists.

The friend of Layers should be a friend of Enthusiasm. Layers is able to account for both Unification and INHERITANCE. In order for Unification to be true, reality must be unified by some general dependence relation that occurs between dependence chains, and this general dependence relation is what the Enthusiast has in mind when she posits Grounding. Why does this particular physical fact explain that particular chemical fact? Because there is a general, coarse-grained form of dependence (Grounding) that flows from the more fundamental layer – the physical facts – to the less fundamental layer. This move isn't available to the Pluralist(-) because she isn't able to posit a dependence relation that is unified to any greater degree than the one that occurs within particular dependence chains. As a result, she must reject both Layers and 1) reject Unification as well or 2) leave why Unification holds unexplained.

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less fundamental than social-constructions? These are all interesting questions, but the general upshot of Layers is that there are gradations to reality that are ordered according to some hierarchical relationship.

<sup>25</sup> Or, as noted in section 3.2, we might understand this as a function of Proximity.

## Chapter 4: Wrapping It All Up

In this final chapter, I will articulate a version of Enthusiasm called the Robust view that satisfies both explanatory and structural sets of desiderata. Subsequently, I will outline what I call the Hybrid view, which is a weaker view which rejects Layers but still manages to accommodate the remaining structural and explanatory desiderata. I will conclude by identifying a unique class of metaphysical explanation called Structural Explanations for which I take Grounding to be indispensable.

### 4.1 The Robust View

If my reader accepts that our theory of explanation should account for the three explanatory desiderata (Dependence, Distance, and Unification) and also accepts that the best theories of metaphysical structure should account for the three structural desiderata (Fundamentality, Proximity, and Layers), then she should be a friend of the Robust view. This view is robust in that it posits a great deal of structure; not only is there a unified dependence relation at work in each individual dependence chain, as the Pluralist(-) believes, but the Robust View holds that there is an even more general dependence relation that is present across dependence chains. This view departs from the Hybrid View primarily by positing that fundamentality is unified even among objects residing in distinct dependence chains.

As she describes in *Making Things Up* (Bennett 2017), Bennett's view is that fundamentality is indexed according to specific dependence chains; one can only compare the relative fundamentality of two entities on the same chain, such as the relative fundamentality of a sofa and one of its constituent carbon atoms. This is to some degree counterintuitive; I might think that I can compare the relative fundamentality of myself and a carbon atom in the Mariana

Trench without depending on this atom in any way, but Bennett's view implies that making this comparison would be a mistake. Nonetheless, there might be good reasons to reserve relative fundamentality comparisons to entities belonging to the same dependence chain. Specifically, if a thoroughly univocal Grounding relation accompanied each instance of a metaphysical dependence relation, Grounding might turn out to be symmetric. Consider a case where, at a given time  $t$ ,  $x$  composes  $y$  and  $y$  constitutes  $x$ , and we understand composition and constitution to be underwritten by some more abstract, privileged form of Grounding. This form of Grounding would then fail to be asymmetric since this relation would hold between  $x$  and  $y$  through the composition and between  $y$  and  $x$  through constitution. For this reason, Bennett favors the view that there is not an abstract, monist form of Grounding at the cost of accepting a less univocal notion of fundamentality.<sup>26</sup>

An alternative, of course, is to accept that there are cases where Grounding can be symmetric. For example, consider the case where the two drunks Dick and Bill are standing against each other. Dick and Bill are considerably inebriated and are not in any regard ambulatory; in fact, they can barely remain upright. They are only able to do so by standing against each other and using the other's weight to support themselves. As a result, we would say that Dick has the property leaning-upright upright and that Bill has the property leaning-upright. What determines why Dick (or Bill) has that property? The Enthusiastic would say that Bill's leaning-upright Grounds Dick's leaning-upright and vice versa. However, that seems to commit us to a view on which explanations can be symmetric. If I explain property  $x$  through appeal to property  $y$ , and I further explain property  $y$  through appeal to property  $x$ , then this implies that

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<sup>26</sup> Bennett also provides other reasons we shouldn't posit a highly abstract, monist form of Grounding that I did not discuss here.

certain explanations can be allowed to be symmetric.<sup>27</sup> For some, this might be an unacceptable result, but for other symmetric explanations might be more palatable. Further, as I have argued in chapter 3, our theory of structure is likely to have ramifications for our view of explanations, so any research in this area must be done in consideration of Grounding's connection to explanation.

## 4.2 The Hybrid View

The Hybrid View posits a less unified structure than the Robust View because it does not require that fundamentality be fully univocal.<sup>28</sup>

The Hybrid view is essentially a modified form Pluralism(-). Recall that the Pluralist(-) could not account for Unification; further, failing to account for Unification arguably commits her to accepting some form of INHERITANCE<sub>Backwards</sub>. While my strategy was to account for Unification through Layers, there might be another way to do so. I believe a viable alternative to Layers is to posit that there are laws of metaphysics. Just as there are physical laws which guide causation, there are also laws of metaphysics (which hold as a matter of metaphysical necessity) that account for Unification. Consider, for example, Law of Metaphysics:

Law of Metaphysics (LoM): It's a law of metaphysics that physical properties determine chemical properties.

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<sup>27</sup> Thanks to Bradley Rettler, who suggested this as a case where Grounding might be symmetric.

<sup>28</sup> I refer to it as 'Hybrid' because it is sort of a middle-ground (sorry) between theories which conceive of Grounding as largely unified or largely not.

LoM is obviously very rough and coarse-grained, and the metaphysician interested in developing more precise accounts of LoM will no doubt do a lot of tinkering. However, even this form of LoM can account for Inheritance. If we understand chemical properties as constructed out of physical properties, then we are in a position to account for Inheritance, and Unification is sure to follow.<sup>29</sup> In this way, we can understand the Hybrid View as Pluralism(-) when supplemented by Laws of Metaphysics.

Metaphysical laws might also play a role in Grounding. There are those (notably Wilsch 2015) who believe that metaphysical laws play a crucial role in Grounding. Schaffer (2017) argues that explanations “involve generalizations, which serve to subsume a given case under a more general pattern,” and that these generalizations “require counterfactual- supporting general principles to impart explanatory force” (Schaffer 2017, 305-306). Schaffer goes on to identify these counterfactual supporting general principles as metaphysical laws which hold as a matter of necessity. The relationship between metaphysical laws and explanation is an area in need of further research, and whatever developments may come are certain to have impact on our view of structure.<sup>30</sup>

While I endorsed realism about layers in the foregoing paragraphs, it might be that the layered view of structure does more harm than good. For example, Thompson (2016) has argued that metaphysical explanations do indeed track structure but propounds that certain components of this structure are epistemic, rather than objective, in nature. If one is sympathetic to this line of

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<sup>29</sup> In fact, Wilsch’s nomological account of Ground makes a very similar move (Wilsch 2015).

<sup>30</sup> The relationship between laws of metaphysics and Grounding has much to do with whether we understand Grounding to be primitive. While Wilsch and Schaffer understand Grounding to be reduced to metaphysical laws (Wilsch 2015, Schaffer 2015), while Bennett understands Grounding to be primitive. Further, some theorists (notably Trogdon 2013) analyze Grounding through Fine’s notion of essence (see Fine 1994). Whether Grounding is primitive or analyzable through other ideological primitives and what bearing this debate has on the view I called Pluralism(-) is not something I have space to further explore.

reasoning, then perhaps there is room for a view on which the layers of reality are epistemic rather than objective. I do not think an objective view of Layers should be rejected without argument, but I am in principle open to the view that some aspects of reality's structure are projections of an agent's epistemic needs. Such a proposition is in line with the spirit of the Hybrid view and is an interesting subject for further research.

On the other hand, one might argue that a thoroughly univocal conception of Layers is a metaphysically suspect characterization of reality. Kathryn Koslicki explains:

“[Dependence] relations *induce* different varieties of ontological dependence in different circumstances and in different respects. Thus, in certain cases and in certain respects, the parts composing a whole may depend on the whole in question; and in certain cases and in certain respects, a whole may also depend on its parts. But we lose the ability to make these distinctions if we simply view parthood itself as a relation of ontological dependence” (Koslicki 2020, 174).

To say that parts depend on wholes in some situations while wholes depend on parts in others is an interesting and controversial thesis. If Koslicki's view can be localized to specific dependence chains and still achieve Proximity, then it might be possible to retain some form of Layers. However, perhaps it turns out that our layered description of reality becomes so convoluted and gerrymandered that we decide that it is no longer theoretically useful. If that is the case, if structure isn't as robust as I have argued, then we can always avail ourselves of the Hybrid view.

Finally, it could be that our talk of fundamentality is more plural than I have might implied. Koslicki, for example, conceives of fundamentality as coming in at least four flavors:

- (i) *Abstraction*. An entity,  $x$ , may be non-fundamental in a particular way relative to an entity,  $y$ , numerically distinct from  $x$ , if it is essential to  $x$  that it is in some way “abstracted” from  $y$ ;  $x$  is a feature of  $y$ ;  $y$  is  $x$ ’s bearer. In this case,  $y$  is more complex than  $x$ ; by focusing on  $x$ , we gain a partial, but not complete, perspective on  $y$ .
- (ii) *Construction*. An entity,  $x$ , may be non-fundamental in a second way relative to an entity,  $y$ , numerically distinct from  $x$ , if it is essential to  $x$  that it is in some way “constructed” out of  $y$ , together with other entities. In that case,  $y$  is an essential constituent of  $x$ ;  $x$  is more complex than  $y$ ; by focusing on  $y$ , we gain a partial, but not complete, perspective on  $x$ .
- (iii) *Artificiality*. An entity,  $x$ , may be non-fundamental in a third way relative to some entity,  $y$ , numerically distinct from  $x$ , if  $x$  is essentially the result of a creative act involving an intentional agent,  $y$ .
- (iv) *Disunity*. An entity,  $x$ , may be non-fundamental in a fourth way relative to some entity,  $y$ , numerically distinct from  $x$ , if  $x$  exhibits a lower degree of unity than  $y$  (Koslicki 2015, 19-20).

Understanding fundamentality as plural raises several important questions. In what way should we understand the relationship between dependence and fundamentality? Why should we identify these concepts as flavors of fundamentality instead of something else? Should the connection between the flavors of fundamentality be understood in terms of genus-species, determinate-determinable, functional realization, or some other view? While these are no doubt challenging questions, I can certainly imagine that a savvy pluralist could provide answers to

them. I am in fact quite sympathetic to the idea that fundamentality could come in flavors, and I am sure we will see interesting work on this topic in the future.

### **4.3 Conclusion: Indispensable to What?**

Premise (ii) of the Indispensability Argument claims that Grounding is indispensable to metaphysical explanations, but this is in need of qualification.

I do not think that Grounding is indispensable to every variety of metaphysical explanation. Glazier (2017) convincingly argues that Grounding is not present in cases of what he calls essentialist explanations. These are cases in which “whenever something is essentially such that A, the fact that A will admit of essentialist explanation” (Glazier 2017, 2873).

Consider, for example, that an electron has unit negative charge.

“Suppose such a metaphysician comes to consider the fact that a certain electron has unit negative charge. What might she say about this fact? Her sense of the science may well incline her to take it to be a ‘rock-bottom’ fact about reality. She may well think, that is, that it is not grounded in any other fact. But what might she say about the electron’s essence? She may well take science to be silent on the matter and so feel free to speculate. She may hold, for instance, that the electron essentially has unit negative charge...The fact that the electron has unit negative charge will then have an essentialist explanation in terms of this essentialist fact. But if the former is not grounded in any other fact, it is a fortiori not grounded in this essentialist fact. The scientifically deferent metaphysician will thus countenance an essentialist explanation where no

grounding explanation exists. And so essentialist explanation cannot be a species of grounding explanation” (Martin Glazier 2017, 2875).

Glazier offers other examples of essentialist explanations which do not appear to be explicable in terms of Grounding, and if he is right, then there is at least one class of metaphysical explanations for which Grounding is not indispensable. There may be others as well.

Therefore, my claim is that Grounding is indispensable to a certain category of metaphysical explanations that I refer to as Structural Explanations. Structural explanations are explanations which are analyzable in terms of each of the features I identified in chapter 3 – Dependence, Distance, and Unification. Refer to the electron as the essence-bearer and the fact that the electron has unit negative charge as the essentialist fact. There does not seem to be any sort of ontological dependence involved in this essentialist explanation. The essentialist fact does not depend on the essence-bearer; rather, the essentialist fact seems to be contained in the essence-bearer. Nor does this explanation a function of Proximity or Distance; the essence-bearer and essentialist fact are related through essence, but essence-bearers and essentialist facts do not stand in relations of relative fundamentality. Finally, essence-bearers and essentialist facts do not admit of Unification or Layers; it’s unclear to me that essence bearers and essence-facts reside deal with unity of layers of reality. In short, it does not seem possible to analyze essence bearers and essence-facts via the explanatory principles described in chapter 3; they seem to be inapplicable in cases of essentialist explanations.

Grounding is, however, indispensable to a certain category of metaphysical explanations that we might refer to as Structural Explanations. I think of Structural Explanations as having to

do with ontological dependence that holds between objects, facts, properties. Structural explanations are pervasive in metaphysics and perform a variety of important theoretical work. Anytime an entity or property residing on a dependence chain is being explained in terms of a distinct entity or property on this chain, then this will admit of a Structural Explanation. Any explanation that utilizes one of the various non-Grounding dependence relations such as set-membership, constitution, mereological, etc., likely falls under the umbrella of structural explanation. Exactly how we are to define Structural Explanations is something I would like to leave open; subjecting it to conceptual analysis is a task best left for another day. For the sake of clarity, however, I will provide an example of how a Structural Explanation might appear in the context of a metaphysical debate: Is what it means to be a chair a socially constructed notion that is grounded in social facts, or is it a natural kind that is grounded in objective physical facts?

On one hand, chairs certainly do have objective physical properties. The matter composing the chair is not by any means socially constructed. Likewise, the color, density, and weight of the chair are not informed by social facts; rather, they are physical facts that obtain independently of people. On the other hand, it's difficult to deny that chairs have any socially constructed properties at all; in fact, most of the properties chairs have do seem to be socially constructed. For one, it seems as though almost anything can belong to the category 'chair.' The object at my kitchen table is a chair, but many other potential objects might also be considered chairs: tree stumps, rocks of the right size and shape, and anything else that is amenable to being sat on. In this sense, most of what it means to be a chair seems to be grounded in the property is-sufficiently-comfortable-when-being-sat-on. While not just anything can attain the status of chairhood – objects such as stars, clouds, and cats might be ineligible to be chairs – I tend to think that this concept is mostly socially constructed. In this way, we can think of the properties

of chairs as being built out of a combination of social and physical properties, and analyzing concepts such as these in terms of structure is able to explain the relationship between properties belonging to difference categories; while chairhood is indeed socially constructed, components of its social properties are grounded in objective physical properties.

In *Writing the Book of the World*, Ted Sider expressed a form of “knee jerk realism” about his belief that there is a world:

“The world is ‘out there,’ and our job is to wrap our minds around it. This picture is perhaps my deepest philosophical conviction. I’ve never questioned it; giving it up would require a reboot too extreme to contemplate; and I have no idea how I’d try to convince someone who didn’t share it” (Sider 2011, 18).

While my views on structure will not likely be able to convince any of the more ardent skeptics that there is a world, it can explain how the entities which live in the world are related to each other and what role they play in explanations. In this way, I think it’s useful to think of ontological dependence in terms of structure. We are able to explain how the properties of social kinds are determined by how people think about them but also by the objective world. We can understand how biological facts are connected to developments in chemistry, and we can articulate why physics cannot be done by sociologists. In the abstract of this thesis, I described structure as a tapestry because that it a good way about thinking what it is; a network of interrelated nodes that are (non)causally connected through some form of metaphysical dependence.

If a theory of explanation divorces structure from explanations, we would have no way of explaining why Dependence, Distance, and Unification are in fact features of certain classes of explanations and hence no way of explaining why there are deep similarities between the roles entities play in structural and the roles they play in explanations. While we could simply take these to be brute facts about the world, I believe we can be more ambitious; we can posit Grounding.

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## Appendix: Glossary

Over the course of this thesis, I have used many terms in non-standard ways, introduced a variety of neologisms, and otherwise used unfamiliar language in order to express my thoughts. In order to aid the reader, I have divided these items into groups by the chapter in which they first appeared. Note: I did not include items which were discussed only in the paragraph below their introduction in the main text.

### Chapter 1: Prologue

#### A.1

**Grounding:** A single, unified notion of dependence often take to be primitive.

**Enthusiasm:** The view that there is a single, unified form of dependence.

**Skepticism:** The view that there is no unified notion of dependence.

**Psychologism:** The view that the phenomenon of Grounding is (mostly) cognitive in nature and does not correspond to a part of reality.

### A.2 Chapter 2: Defining ‘Explanation’

#### A.2.1

**SUSY:** The window broke because Susy threw a rock at it.

**SOCRATES:** The fact {Socrates} exists obtains because the fact Socrates exists obtains.

**GAMBLING:** Joe lost money playing slots because the house always wins.

**FISSION:** The Plutonium atom emitted a positron because it underwent radioactive decay.

#### A.2.2

**Unionism:** The view that Grounding and metaphysical explanation are identical concepts.

**Separatism:** The view that Grounding backs metaphysical explanation.

### A.2.3

**SOCRATES**<sub>Necessitation</sub>: That Socrates exists explains why {Socrates} exists because Socrates necessitates {Socrates}.

**{SOCRATES}**<sub>Necessitation</sub>: That {Socrates} exists explains why Socrates exists because {Socrates} necessitates the existence of Socrates.

### Argument from Indispensability

- (i) If Grounding is indispensable to a successful account of metaphysical explanation, then we ought to posit Grounding.
- (ii) Grounding is indispensable to a successful account of metaphysical explanation
- (iii) Therefore, we ought to posit Grounding.

## Chapter 3: The Structure of Reality

### A.3.1

**Dependence:** In a given successful metaphysical explanation, the explanans is asymmetrically depends on the explanandum.

**Univocality:** There is only one, unified notion of Fundamentality.

**TABLE**<sub>parts</sub>: A group of carbon atoms are more fundamental than table parts they compose (i.e. the table-legs, the table-top, etc.) as well as the table taken as a whole.

**Particularism:** The view that Fundamentality is thoroughly particular; that there is no sense in which fundamentality is a unified concept.

**Pluralism:** Fundamentality is univocal insofar as it is indexed to particular dependence chains.

**Being-an-Independent:** The property of not depending on anything else.

**Being-a-Positive:** The property of being absolutely fundamental.

**The Question:** Is the class of Independents the same as the class of Positives

### A.3.2

**SUSY<sub>Big Bang</sub>:** In a causally deterministic universe, the window shattered because of the Big Bang.

**Distance:** Explanations are liable to fail even in cases where the explanandum depends on and is necessitated by the explanans.

**EVENT:** The window shattered.

**TABLE:** The table has the property of being brown, wooden, and hard.

**Proximity:** Each entity in a dependence chain bears to each other entity located on this chain a unique degree of relative fundamentality except in cases of equifundamentality.

### A.3.3

**Pluralism(-):** For any given dependence chain where x depends on y, y depends on z, z depends on ... there is a general, unified form of dependence.

**INHERITANCE:** Properties of constructed entities are determined by properties of their constituents.

**INHERITANCE<sub>Backwards</sub>:** Properties of constituent entities are determined by properties of the entities which they construct.

**Unification:** For a given explanation, certain categories of facts are metaphysically ineligible to feature as the explanans for a given explanandum.

**Layers:** Reality is partitioned into levels in some mind-independent, objective sense.