

On the Plurality of Grounds

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Recent metaphysics has contained a good deal of discussion about the notion of *ground*.¹ The notion is intuitive enough: for example, it is sometimes said that Europe's being at war in 1939 is grounded in facts concerning the actions of its citizens during that time, meaning (something like) that it was in a state of war "in virtue of" the actions of its citizens, or that those actions are what "made it the case" that it was at war, or that its being at war is to be "explained in terms of" those actions. Regardless of whether this claim about the war's ground is true, our pre-theoretic grasp on what it means seems reasonably strong.

Much of the recent literature on ground has been focused not on particular claims about what grounds what, but on the nature of the grounding relation itself. One aim of this paper is to contribute to this project. In particular, I will suggest that ground is an *irreducibly plural* relation: when X is grounded in Y, both X and Y may be pluralities of entities or facts. Now, it is widely recognized that Y may be a plurality; indeed, Europe's being at war in 1939 is a good example of something that is presumably grounded in a multitude of facts concerning the actions of its many citizens during that time. *Those* facts together *are* what explains its being at war, even though none of them is a sufficient explanation when taken individually. But while it is recognized that Y is sometimes a plurality, it is assumed that X is always a single entity. Here I disagree and suggest that X is sometimes a plurality too: there are cases in which a plurality of facts taken together are grounded in some underlying facts even though none of them has a ground when taken individually. *They*, the members of X, *are* explained in terms of more fundamental facts, but none on their own admits of explanation.

I should say that recognizing the mere *possibility* of X's being a plurality is enough to have a significant impact on a number of debates in metaphysics. For one of the central aims of contemporary metaphysics is to establish which aspects of the world are fundamental and which are "merely derivative", and the canonical strategy of arguing that a given aspect of the world is fundamental is to argue that it has no ground. But if X can be a plurality then this line of argument is invalid, for even if a given aspect of the world

¹See Fine [7], Rosen [17], Schaffer [16] and Sider [15] for starters.

has no ground it may nonetheless be part of a plurality of aspects that together have a ground, in which case it would be a mistake to conclude that it is fundamental.

Far from just being a mere possibility, though, I think that there are actual cases in which X is a plurality. For example, consider the set of all individualistic facts, i.e. facts that concern particular individuals such as

Saul Kripke is a philosopher

Barack Obama is president

This very book (pointing at the book on my table) is interesting

I believe that these facts together are (plurally) grounded in the purely qualitative nature of the world, even though none of them taken individually has a qualitative ground. For another example, consider the set of all facts about mass-in-kilograms, such as

The president is 75 kgs

The laptop on the table is 2 kgs

The book next to the laptop is 1/2 kg.

Once again, I believe that these facts are (plurally) grounded in the mass-relations between things, even though none of them taken individually has such a ground. The resulting views are naturally called “structuralist” conceptions of individuals and kilograms respectively, since an account of what any one member of the group consists in is inevitably an account of them all. A second aim of this paper is to motivate both these structuralist views. So the paper has two distinct topics—the nature of the grounding relation in general, and the metaphysics of individuals and kilograms in particular—but they dovetail naturally together, for by examining the nature of individuals and kilograms I hope to learn something about the plural nature of ground; and by examining the plural nature of ground I hope, in turn, to learn something about the nature of individuals and kilograms.

I will start in Section 1 by saying a little more about the notion of ground in play. Then in Section 2 I will turn to the case of individuals and motivate the structuralist view just outlined. Actually, I will not argue for structuralism *per se* because the view makes a substantial claim about the fundamental nature of the world that there is no space to motivate here, namely that the world is fundamentally qualitative. Instead, I will argue for the conditional claim that *if* the world is fundamentally qualitative, we should be structuralists and think that individualistic facts are plurally grounded in the qualitative. In Section 3 I will argue for an analogous claim in the case of kilograms: i.e. that conditional upon an assumption about the fundamental nature of the world, we should be structuralists and think

that kilogram facts are plurally grounded. In Section 4 I will develop both structuralist views in response to an objection. Now, even if the arguments in Sections 2–4 are successful, they do not establish that ground is in fact a plural relation since they are only arguments for the conditional claims just mentioned. Nonetheless, they will motivate the *possibility* that ground is plural, and as I said this is enough to have a significant impact on a number of debates in metaphysics. In Section 5 I will consider just one debate, the nature of individuals, and explain in more depth how the possibility of plural grounds affects the theoretical landscape.

1 Ground

Let me start by clarifying the notion of ground at issue. As I said in the introduction, ground is an explanatory notion: to say that X is grounded in Y is to say that Y explains X. But the kind of explanation being given is of a distinctively metaphysical sort. To illustrate, consider again Europe’s being at war in 1939. What explains this? A causal answer might describe events during the preceding 50 years that led, say, Chamberlain to declare war on Germany. But there is another kind of answer that would try to say *what it is* for Europe to be at war in the first place. Regardless of what caused Chamberlain to declare war in 1939, someone in search of this second type of answer wants to know what it is about the state of the continent that *makes it the case* that it is at war. When we say that Europe’s being at war is grounded in facts about the actions of its citizens, we mean that those latter facts explain what it is for Europe to be at war in this second sense of explanation.

Now, the canonical form of a claim about grounds is normally stated as

X is grounded in Y

but there are a number of things to clarify about this formulation. First, since ground is an explanatory notion, we may distinguish between full and partial grounds: something’s full ground is its complete explanation, of which a partial ground is a part. I will use ‘ground’ to mean full ground, though nothing will turn on this choice. As a result, the canonical form above should be read as saying that Y fully explains X.

Second, what are the relata X and Y? Well, we variously explain facts, events, true propositions, property-instantiations and states of affairs. I will take ground to be a relation between facts, but again nothing will turn on this choice. I will not assume much about what what facts are—in particular, I will remain neutral as to whether they are structured entities like Russellian propositions—but I will take them to be reasonably fine grained and allow that logically equivalent facts can be distinct.²

²My decision to treat grounding as a *relation* between entities is not forced. As Fine

Third, I said earlier that ground is normally assumed to be plural in its second position, i.e. that Y may be a plurality of facts, and I will follow this consensus.³ Of course, to say that grounding is plural in its second position leaves it open that in some cases Y is a single fact (the limit case of a “pluarlity”). However, it is also assumed in the literature that ground is singular in its first position, i.e. that X is always a single fact. The assumption is implicit since the issue is not even raised, but it is made nonetheless: indeed, the canonical form just stated contains the word ‘is’, which (grammatically speaking) assumes that X is a single fact. However, I believe that this assumption should be questioned. Call the consensus view that X is always a single fact a *singularist* view of grounding, and in contrast let *pluralism* be the view that X is sometimes a plurality (where pluralism is understood to leave it open that in some cases X is a single fact). For the pluralist, then, the ‘is’ in the canonical formulation should sometimes be replaced with ‘are’. Importantly, when the pluralist says that X is a plurality of facts, she does not mean that the conjunction of the X is grounded in Y. Instead, think of her as saying, of the many X, that *they are* grounded in Y (see footnote 3 for further clarification of this point).

In what follows I will make two assumptions about ground. The first is modal: I will follow orthodoxy and assume that the grounded is metaphysically necessitated by its grounds. That is, I assume that if X is grounded in Y then, necessarily, if the facts Y hold then the facts X hold too. This is plausible enough: if Europe’s being at war in 1939 is grounded in facts about the actions of its citizens at that time, then those facts are *what made it the case* that Europe was at war, or are that *in virtue of which* it is at war. But if so, it would appear to be impossible for them to obtain and yet for Europe to be at peace.

But this is the only relation between grounds and modality that I will assume. In particular, I will not assume that the reverse holds: X may be necessitated by Y and yet may not be grounded in Y. For example, the fact that $2+2=4$ is necessitated by the fact that Obama is the president, but is (presumably) not grounded in it. Moreover, I will not assume that the grounded necessitates its ground either. For example, the disjunctive fact that snow is white or grass is purple may be grounded in the fact that snow

[7] notes, one may also treat it as a sentential operator, in which case a claim of ground is of the form ‘S because T’, where S and T are sentences (so long as we take “because” in its metaphysical, not causal, sense). Readers who are squeamish about reference to facts may therefore re-formulate this paper in less ontologically committing terms.

³This is a little sloppy: to say that Y is a plurality should not be thought of as implying that there is some entity, the plurality (such as a conjunction or a set) that grounds X. Instead, it is to say that the canonical formulation of a claim about grounds is that X is grounded in the facts Y_1, Y_2, \dots . Perhaps it would be more accurate to say that Y is a plural variable. Nonetheless, for ease of prose I will stick to the (slightly sloppy) talk in the text in which the use of ‘Y’ makes apparent reference to some entity, the plurality.

is white even though the former does not necessitate the latter.⁴

The second assumption I will make about grounds concerns its explanatory nature. As with other explanatory relations I will assume that all parts of an explanation must themselves be explanatorily relevant. This is a natural assumption to make in the case of causal explanation: even if the window's breaking is causally explained by the brick's impact, it is not causally explained by the brick's impact and the size of Obama's ears, for surely the size of Obama's ears is completely irrelevant to the matter. In this case we think that adding irrelevant information to the explanation does not merely make the explanation longer but actually defeats the initial explanation. I will assume the same for ground.⁵ Now, I take the notion of relevance here to be reasonably intuitive so I will not say too much about it. But note that just because Y is relevant to an explanation of why X holds, it does not follow that Y is part of *every* explanation of X. For example, it is plausible that the disjunctive fact that snow is white or grass is green is grounded in snow's being white and is also grounded in grass's being green (i.e. the disjunction is "overdetermined"). In this case, while both disjuncts are clearly relevant in their respective explanations, neither disjunct figures in both explanations.

That is what I will assume about ground, but I will not assume much else. In particular, I will not assume that ground is a transitive relation. We will, however, have occasion to speak of the transitive closure of ground, so let us call it the relation of "derivative ground" for future reference. Finally, I will not be assuming anything about the status of claims about ground. One might adopt a "Humean" view of ground, according to which facts about what grounds what are themselves grounded in whatever grounds everything else (e.g. physical facts, if one is a physicalist).⁶ Or one might adopt an "Anti-Humean" view of ground, according to which facts about what grounds what are in some sense extra facts above and beyond everything else.⁷ I will remain neutral between these two views in what follows.

That completes my description of the sort of grounding relation I have in mind. I will now turn to examine how the relation behaves in the case of individuals.

⁴Note that if snow were black and grass were purple the disjunction would be grounded in the fact that grass is purple instead. Therefore, it can be a contingent matter what a given aspect of the world is grounded in.

⁵As a result, ground is (like other explanatory notions) non-monotonic: if X is grounded in Y, it does not follow that X is grounded in $Y \cup Z$. See Rosen [17] for more on this point.

⁶See, for example, Sider [15], who understands claims about what grounds what as semantic claims and therefore thinks that such claims are grounded in whatever grounds semantics in general.

⁷I have not seen an Anti-Humean view of ground defended explicitly, but much of what Rosen [17] says is naturally interpreted along these lines.

2 Finding Individuals in a Qualitative World

Individualism vs Qualitivism

The aim of this section is to argue for the conditional claim that if the world is fundamentally qualitative, then individualistic facts are plurally (rather than singularly) grounded in the qualitative. But before I do that, I should explain my terminology. First, let an *individualistic fact* be a fact that concerns a particular individual. I gave some examples above, but in general they are facts of the form

$$a \text{ is } F, b \text{ is } G, a \text{ bears } R \text{ to } b, a \neq b$$

where a and b are individuals. These are to be contrasted with *qualitative facts*. To say what these are, let a *qualitative property* be a property that does not concern any particular individual. For example, the property of wearing a green sweater, the property of having a sister, and even the property of having two sisters are all qualitative: even if my having these properties implies the existence of other individuals, they are qualitative because they do not concern any particular individual. (This is in contrast to what we might call *individualistic properties* such as the property of being identical to Kripke and the property of being Obama's sister, which concern the particular individuals Kripke and Obama respectively). With this distinction in mind, we can say that a *qualitative fact* is a fact that concerns how the world is just with respect to the distribution of qualitative properties.

For example, qualitative facts include all the facts that can be expressed in predicate logic without constants but with identity, such as

$$(\exists x)Fx, (\exists x)(\exists y)(Fx \ \& \ Gy \ \& \ x \neq y), (\forall x)(Fx \supset Gx)$$

so long as all our predicates express qualitative properties. If you think that there are facts about how qualitative properties are bundled together—as a so-called “bundle theorist” would (more on whom below)—then these would also be qualitative facts.⁸

Of course, one might ask how the distinction between the individualistic and the qualitative is to be defined in more detail, and this is a good question. But I think we understand the distinction well enough to be getting on with, so I will not address this question here. The only thing I should add is that I do not consider tropes, or property-instances, to be qualitative properties.

Now, the world appears to be replete with both individualistic and qualitative facts, but how are they related? On one view, the individualistic is prior to the qualitative: the idea is that the fundamental facts about

⁸I should emphasize that while the individualistic facts above are all expressed with referring terms, qualitative facts may be expressed with referring terms too so long as they do not refer to particular individuals but (say) to qualitative properties.

the world include individualistic facts about how a domain of individuals are propertied and related to one another, and qualitative facts are (for the most part at least) grounded in those individualistic facts.⁹ Call this view *individualism*. But another view is that the qualitative is prior to the individualistic: the fundamental facts of the world on this view are all qualitative, and individualistic facts are then all ultimately grounded in the world's fundamental qualitative nature. Call this view *qualitativism*.¹⁰ Actually, both views should really be expressed in terms of *derivative* ground rather than ground. This is because someone who denies that ground is transitive might think that individualistic facts about macro-sized objects (such as my laptop) are grounded in individualistic facts about the particles composing them, and that the latter facts are in turn grounded in qualitative facts, but deny that the former individualistic facts themselves have qualitative grounds. Still, she may think that all individualistic facts are derivatively grounded in the qualitative, and this is enough to capture the idea that the qualitative is prior to the individualistic and thereby count as a qualitavist. A similar comment applies to the individualist. But I'll generally ignore this detail and talk in terms of grounds unless it matters.

Individualism is, at least at first glance, an attractive position: we naturally think that the world is composed of fundamental entities or particles propertied and related in various ways, and facts about how qualitative properties are distributed through the world are grounded in their being instantiated by these individuals. For example, suppose there is a certain positively charged particle, Peter, in a box. It is natural to think that the (qualitative) fact of there being *something* positively charged in the box is grounded in the (individualistic) fact of *Peter* being positively charged and in the box. However, I favor qualitativism. My reasons are broadly Occamist: I believe that individualistic facts are redundant to causal explanations of all observable phenomena, and for this reason should not be thought of as being part of the world's fundamental nature.¹¹ But my aim in this section is not to argue for qualitativism but instead to argue that *if* qualitativism is true, then individualistic facts are plurally (rather than singularly) grounded in the qualitative nature of the world.

To this end, it will be useful to clarify qualitativism a little more. The classic example of a qualitavist view is the traditional Bundle Theory, ac-

⁹Why the qualification 'for the most part'? Because the individualist may wish to include a "Totality" fact in their fundamental basis, which states (something like) that a certain collection of individuals or facts are *all* the individuals or facts there are. But this complication will not matter to us here so I will ignore it in what follows.

¹⁰Logically speaking, these views are not exhaustive since a third possibility is that some other realm of fact grounds the individualistic and the qualitative. Yet another possibility is that the individualistic and the qualitative are entirely independent: neither is grounded in the other and nor do they have a common ground. But I will ignore these possibilities in what follows.

¹¹This line of argument is developed by Dasgupta in his [5].

according to which individuals are identified with bundles of properties. On this view, the fundamental facts of the world concern which properties are “compresent”, to use Russell’s term. For example, if we would ordinarily describe a situation as being one in which something is spherical and positively charged, the bundle theorist would describe it as being one in which, fundamentally speaking, the properties of being spherical and being positively charged are compresent. Individual objects such as Peter the particle are then identified with collections of compresent properties. In this way, Peter’s being positively charged is grounded in the fact that the collection of compresent properties that is Peter contains the property of being positively charged.

But it will be important in what follows to recognize that there are many other varieties of qualativism. To categorize them, note that qualativism is the conjunction of two claims: (1) That the fundamental facts of the world are all qualitative, and (2) that individualistic facts are grounded in the qualitative. Both claims can be cashed out in a number of different ways, leading to a number of different qualativist views. With regards to the first claim, the Bundle Theory says that the fundamental facts concern which properties are compressed, but other qualativists might say that the fundamental facts are all existentially generalized facts, or even that they are some other sort of qualitative fact we have not outlined here.¹² With regards to the second claim, the Bundle Theory provides a qualitative ground for each individualistic fact simply by identifying individuals with collections of compresent properties, but other qualativist views might provide qualitative grounds for each individualistic fact without making the identification. And with pluralism about ground on the table, we should recognize the possibility of a qualativist who denies that individualistic facts have qualitative grounds on their own but instead provides a qualitative ground for them plurally. So, while qualativism is usually discussed in the literature under the guise of the Bundle Theory, that is in fact only one way to cash out the view.

Before we move on, let me briefly explain why claim (2) is included in my description of the qualativist at all. After all, some theorists would characterize qualativism just as the claim that the fundamental facts are all qualitative, and thereby leave open the possibility of a qualativist who adopts an “eliminativist” view that there are no such things as individualistic facts rather than the “reductionist” view I have foisted upon her by definition. And I would agree that in many ways this way of cutting the pie is cleaner. However, much of the recent interest in the notion of ground is driven by the vision that all the benefits of eliminativist views can be enjoyed by more plausible reductionist views cast in terms of ground. For example, the hope is that those impressed by, say, nominalist arguments for

¹²A qualativist view of this latter sort is motivated and defended by Dasgupta in his [5]. Other qualativist views of this latter sort are explored in Hawthorne and Sider [9].

the view that numbers do not exist need not actually accept that radical conclusion, but instead see those very same arguments as supporting the view that the existence of numbers is grounded in facts about the material world. Similarly, someone impressed with arguments that individualistic facts are somehow “second rate” is likely, if she grants the notion of ground, to see them as motivating not the eliminativist view but the reductionist view instead. Since the notion of ground is being taken for granted here, it makes sense for our purposes to characterize qualitativism as the conjunction of claims (1) and (2). Similar remarks apply, of course, to individualism.

Necessitating and Explaining

Let me now argue that if qualitativism is true then the individualistic is *plurally*, and not singularly, grounded in the qualitative.

Actually, that’s not quite the thesis I wish to argue for. Remember that the qualitavist really thinks that individualistic facts are *derivatively* grounded in the qualitative, so she may think that there are individualistic facts without qualitative grounds. But every qualitavist will think that at some point in the chain of grounds there is a domain D of individualistic facts that have qualitative grounds. So the thesis I wish to argue for is that if qualitativism is true then the members of D—whatever they are—are plurally, and not singularly, grounded in the qualitative.

To say that the members of D are singularly grounded in the qualitative is to say that each member considered on its own has a qualitative ground. I do not wish to presume what D is, but let us suppose for the sake of argument that it includes the fact

Barack Obama exists

I will first argue that it is extremely unobvious what qualitative grounds it could possibly have, and then argue that the problems that beset finding such qualitative grounds disappear entirely when we try to plurally ground all the members of D together in the qualitative. As we will see, nothing will turn on my choice of fact here: my arguments will apply to all qualitavists no matter what sort of facts she thinks comprise D.

So, if we consider Obama’s existence on its own, what qualitative grounds could it have? We have seen that qualitative facts include existentially general facts, universally quantified facts, and facts about which qualitative properties are compresent, so the qualitavist might try to ground it in any of these. However, for the sake of argument let us restrict ourselves to considering existentially quantified facts. Once the problems that beset using them to ground Obama’s existence are set out, it will be clear that they are not solved by appealing to any other kind of qualitative fact.

So the view under consideration is that Obama’s existence is grounded in a set S of existentially general facts of the form

$(\exists x)Tx$

where T expresses a qualitative property. And the trouble for this view, quite simply, is that there is no plausible candidate for the set S.

To see this, note that S could be more or less wide-ranging. At one extreme, S might contain every single existentially quantified fact that obtains, while at the other extreme S might contain only a small number of facts stating the existence of something with just a few of Obama's qualitative properties such as being born on a small island and being well educated. But this second, restricted set of facts is not sufficient to ground Obama's existence, for it is perfectly possible for someone to have these qualitative properties and yet not be Obama. Remember, I am assuming that the grounded is necessitated by its grounds but, intuitively at least, this restricted set of general facts would not necessitate Obama's existence. At the other extreme, suppose that S contains all the existentially quantified facts that actually hold. We may concede that these facts do indeed necessitate Obama's existence—indeed, it would be natural for the qualivist to think this—but the trouble now is that S contains explanatorily irrelevant facts. For example, it contains facts about the existence of electrons 10 million light-years away, and intuitively these are completely irrelevant to an explanation of what it is for Obama to exist. Remember, I am assuming that all parts of a fact's ground must themselves be explanatorily relevant. Therefore, even if there is some sub-set of S that does explain Obama's existence, adding irrelevant facts about electrons 10 million light-years away to the explanation does not just make it longer but instead defeats the initial explanation. Since S contains such irrelevancies, it does not ground Obama's existence.

The question therefore arises as to whether there is some intermediary set of existentially quantified facts that is both wide-ranging enough to necessitate Obama's existence and yet restricted enough to include only those facts of explanatory relevance. I submit that it is extremely doubtful whether such a set exists. The problem here is not that facts are too coarse-grained, so that deleting an explanatorily irrelevant fact from a candidate S *ipso facto* deletes so much content that Obama's existence is no longer necessitated. Instead, the problem is simply that no matter how fine-grained the facts are, there is absolutely no guarantee that once the irrelevancies are subtracted we are left with a set that still necessitates his existence. Since there is no guarantee, the burden is on the theorist who thinks that there is such a set to tell us what it could possibly be.

The problem is brought into stark relief if we assume for a moment an essentialism about origins, according to which Obama was necessarily conceived from a particular sperm cell C. On this view, it is possible for something to have led exactly the same qualitative life on this planet as Obama and yet not be Obama, by virtue of having been conceived from a

different sperm. It would follow that even if S were the set of *all* existentially quantified facts about Obama's life on this planet, this would still not be wide-ranging enough to necessitate his existence. And of course we cannot add to S that the person was conceived from C , since that is a singular fact. Therefore, in order to necessitate Obama's existence S would have to be more wide-ranging than the set of all existentially quantified facts about Obama's life on this planet, in which case S is in serious danger of containing facts that are, intuitively, explanatorily irrelevant.

But regardless of essentialism about origins, the problem facing us is clear: in order to necessitate Obama's existence S must be wide-ranging—perhaps it must even be the set of all the existentially quantified facts that actually obtain—but in order to be explanatorily relevant it must be restricted. The two constraints work against each other and it is unclear whether they can be met at once. This does not of course prove that they cannot be met, but I think enough has been said to cast doubt.¹³

At this point one might suggest that the obvious solution is to let S be a very large disjunction. For example, if we let E_w be the conjunction of all existentially quantified facts that obtain in w , then we might propose that S is the disjunction of all the E_w for any w in which Obama exists.¹⁴ But if one thinks that grounding is transitive then, given the plausible thesis that disjunctions are grounded in their disjuncts, this suggestion implies the view that Obama's existence is grounded in the set of all existentially quantified facts that actually obtain, which we have already rejected. And in any case, the suggestion is wildly implausible since S would contain much that is, intuitively at least, entirely irrelevant to an explanation of Obama's existence.

Now, I have assumed so far that S would contain only existentially quantified facts, but it is clear that the situation is not helped by including universally quantified facts too. Moreover, exactly the same problem will beset a qualitatist who tries to ground Obama's existence in facts about which properties are compresent, for the compresence of *which* properties would explain Obama's existence? Not a restricted set of his qualitative properties, since their compresence will not necessitate his existence. And nor a very wide ranging set of qualitative properties: perhaps the compresence of the property of existing in a world with a certain complete qualitative description would necessitate Obama's existence, but it would contain so much irrelevance as to fail to explain his existence.

¹³Note that the trouble is not that descriptivism about names—the thesis that names are synonymous with definite descriptions—is false. After all, descriptivism is a semantic theory about names in natural languages, and it is perfectly consistent with its falsity that facts expressed with names are nonetheless grounded in facts expressed with definite descriptions.

¹⁴A similar suggestion is discussed by Adams in his [1] as the most plausible way to make sense of Leibniz's view.

Work for Pluralism about Ground

So far I have argued that if we consider Obama's existence in isolation, we have trouble grounding it in the qualitative nature of the world. But the situation is very different once we recognize the possibility of plural grounds, for in that case the qualitatist might concede that Obama's existence has no qualitative ground on its own and yet insist that individualistic facts such as his existence do have a qualitative ground when taken as a plurality.

How might the view be cashed out in detail? Here is one proposal. Let I be the set of all individualistic facts that actually hold and let E be the set of all existentially quantified facts that actually hold. Then our thesis may simply be that the members of I are (plurally) grounded in E . Call this a *structuralist* view of individualistic facts, since an explanation of what makes any one member of I hold is inevitably an explanation of them all.

Of course, there are many details to argue about here. Someone might argue that the qualitative ground should include some universally quantified facts too, or perhaps some negative facts, in addition to E . Others might argue that only individualistic facts about the fundamental particles are plurally grounded in the qualitative nature of the world, and that other individualistic facts in I (e.g. those concerning my table) are grounded in the individualistic facts about fundamental particles. All these arguments are worth having, but they are in-house debates between theorists all of whom deserve to be called "structuralists". Since the differences between their views will not matter here I will focus on the particular structuralist view outlined in the last paragraph.

Notice that structuralism avoids all the worries raised above about grounding Obama's existence on its own. For while it was implausible that Obama's existence is grounded in E —remember, E contains facts about the existence of electrons 10 million light years away which, we said, are completely irrelevant to an explanation of Obama's existence—this complaint loses its force against the structuralist. After all, I contains individualistic facts concerning those electrons, so it is no surprise that qualitative facts about them are part of what explains I 's members! And while we objected to the claim that Obama's existence is grounded in a very restricted set of qualitative facts by pointing out that those restricted facts would not necessitate Obama's existence, this objection also loses its force when run against the structuralist, for it is not so implausible to maintain that E necessitates I . Indeed, since the structuralist is a qualitatist she is likely to think in any case that any two worlds agreeing on E agree simpliciter. If there is a problem with that commitment then it is a problem with qualitatism itself, but it is not specifically a problem with the structuralist thesis that the members of I are grounded in E . Thus, structuralism neatly satisfies the joint constraint that a ground must both necessitate and be explanatorily relevant to what it grounds.

Does the structuralist think that the conjunction of all members of I is (singularly) grounded in E ? Perhaps, but if so only in a derivative sense. That is, the structuralist might plausibly say that the conjunction is grounded in its conjuncts, and that those conjuncts are (plurally) grounded in E . If she thinks that ground is transitive, this implies that the conjunction is grounded in E too; and if she does not, then this still implies that the conjunction is *derivatively* grounded in E .¹⁵ But structuralism is *not* the view that the conjunction is itself grounded in E “directly”, i.e. without it being grounded in its conjuncts, for this view violates the plausible principle that a conjunction is grounded in its conjuncts.

Structuralism is in some sense a more radical departure from individualism than traditional versions of qualitavism. The individualist, remember, thinks that some individualistic facts are a fundamental part of the world’s make up. Traditional qualitavists deny this by attempting to make sense of each individualistic fact in qualitative terms: for example, the Bundle Theorist will see a certain set of compressent properties in the world and declare “here is Obama!” But there is a sense in which the structuralist does not make any sense of Obama’s existence in the first place: his existence is (on this view) certainly not fundamental, and nor is there any part of the underlying qualitative world which is responsible for his existence. The structuralist can of course locate the existence of *every individual taken together* in the world’s qualitative nature, but when it comes to *Obama himself*, the structuralist finds that his existence has melted away into nothing more than a “node” in a complex web of singular facts.

I will discuss structuralism in more depth in Section 4. But before that, I want to motivate a similar view in the case of kilograms.

3 Finding Kilograms in a Comparative World

Absolutism vs Comparativism about Quantities

To frame the discussion, we need to distinguish two views about the metaphysics of quantity. Quantities are the sorts of features that things can have more or less of. Temperature, weight, charge, as well as the spatial distance between two things or the temporal distance between two events are all quantities, as I understand the term. Now, consider the case of mass. When an object has mass, what sort of property does it have? It is natural to think of it as having an intrinsic property, something that it has independent of its relations to other material things. But we also think that things with mass stand in various mass-relations to one another. Some of these relations are ratios, such as the relation of x being twice as massive as y ; others are

¹⁵Remember, the relation of derivative grounds is the transitive closure of the relation of grounds.

merely ordinal, such as that of x being more massive than y . Now, of the intrinsic masses and the mass-relations, which are fundamental? On one view, the fundamental facts about mass are facts about which particular intrinsic mass each object has, i.e. facts of the form

a has the intrinsic mass M

Call this view *absolutism* about mass. The absolutist does not deny that things with mass also stand in mass-relations to one another, she just insists that these sorts of facts are grounded in facts about each object's intrinsic mass.¹⁶

In contrast, the *comparativist* claims that the fundamental facts about mass are facts about the mass-relations between objects. Now, as stated this leaves open what kinds of mass-relations are fundamental. Some comparativists will insist that only facts concerning the ordinal relations between things, i.e. of the form

a is more massive than b

are fundamental, while other comparativists will claim that facts about mass-ratios of the form

a is 2 times as massive as b

are fundamental (either as well as or instead of the ordinal facts). But this in-house dispute will not matter in what follows. I will focus on the case of mass in what follows, but it is worth noting that the absolutist/comparativist distinction arises for all quantities.¹⁷

I favor comparativism. Very briefly, my reason is Occamist and is based on two premises. First, that all we can ever observe or measure are comparative facts about quantity: e.g. that a bunch of grapes balances with a certain weight that a farmer and I agree upon as our standard. And second, that given any physical theory which appears to make reference to facts that the absolutist regards as fundamental, there is an empirically equivalent physically theory which makes reference *only* to comparative facts and which scores equally well on such theoretical virtues as simplicity, explanatory adequacy, and so on. From these two premises, Occam's razor would recommend that we dispense with the unobservable facts about absolute quantity and become comparativists instead.

¹⁶Along, perhaps, with facts about how the intrinsic masses themselves are related to one another. The details of the view can be cashed out in many different ways, but these differences will not matter in what follows. See Armstrong [3], Bigelow and Pargetter [4] and Mundy [12] for more on this issue.

¹⁷As I set up the positions, the debate between absolutists and comparativists has not been widely discussed. However, Armstrong [2] and Mundy [12] are both naturally read as defending absolutism, while Field [6] and Bigelow and Pargetter [4] are naturally read as defending comparativism.

However, my aim in this section is not to argue for comparativism but to argue that *if* one is a comparativist, then one should think that certain facts about mass are plurally (rather than singularly) grounded in comparative mass facts. To this end, consider the following facts:

My laptop is 2 kilograms

David Beckham is 75 kilograms

These “kilogram facts” are also facts about mass, so the question arises for the comparativist as to how they are to be grounded in the fundamental facts about mass relations. I will first argue that if we assume singularism about ground and try to ground each kilogram fact on its own, it is extremely difficult to see what comparative ground they could possibly have. Then I will argue that the problems disappear when we try to plurally ground them together.

Necessitating and Explaining Revisited

Before discussing how the comparativist might ground kilogram facts, it will help to see how the absolutist will approach the issue. I believe her best approach is simply to say that each kilogram fact is grounded in facts about which particular absolute mass things have. For example, the fact

My laptop is 2 kilograms

will, on this view, be grounded in the fact

My laptop has a certain intrinsic mass M

Now, one might object that this leaves out the role that standards and benchmarks play in measurement. For example, one might object that the famous cylinder of platinum-iridium alloy kept in controlled conditions in Paris, known as the ‘International Prototype Kilogram’ or ‘IPK’ for short, must play a role in grounding facts about mass-in-kilograms. But the absolutist might respond by noting that IPK plays a role in explaining not what it is for my laptop to be 2 kilograms, but how our term ‘2 kilograms’ came to mean what it does. One might, for example, say that expressions of the form ‘ r kilograms’ were introduced into our language with the stipulation that they refer to the absolute mass that is r times the absolute mass had by IPK.¹⁸ On this view, IPK plays a role in explaining how it came to be that ‘My laptop is 2 kilograms’ expresses the particular fact it expresses, but when we come to ask what that particular fact is grounded in the answer is just that it is grounded in the fact that my laptop has a certain intrinsic mass.

¹⁸This view was famously defended by Kripke in his [11]. I should say that I do not think that it is correct, for reasons that will emerge later.

So the task of grounding kilogram facts is reasonably straightforward for the absolutist, even if she is a singularist about ground. But what about the comparativist? So long as she is a singularist about ground and tries to ground each kilogram fact in turn, I believe she will face grave problems. Interestingly, these are analogous to the problems that arose in the last section when we tried to find qualitative grounds for each individualistic fact in turn.

To see this, take as an example the fact

(K) *My laptop is 2 kilograms*

(I name this fact ‘(K)’ for ‘kilogram’), and let us suppose that our comparativist is a singularist about ground. Her challenge, then, is to ground (K) in some set S of facts about mass relations.¹⁹ And the trouble is that there does not appear to be a plausible candidate for S.

Why? Well, let us presume that S contains facts about the mass-relations between my laptop and other objects. Given this presumption, the difficulty may be raised by noting that S may be more or less wide-ranging (here we mimic our argument in the case of singular facts). At one extreme, S may contain facts about the mass-relations between my laptop and every single object in the entire universe; while at the other extreme, S may only contain facts about how my laptop is mass-related to a single object.

But the latter option will not work. To see this, note that the obvious choice of object would be IPK, so the idea would be that (K) is grounded in the fact

(I) *My laptop is twice as massive as IPK*

(I name this fact ‘(I)’ for ‘IPK’).²⁰ But one problem with this view is that (I) does not necessitate (K), for it would appear to be perfectly possible for my laptop to be twice as massive as IPK and yet for it not to be 2 kgs. To see this, just imagine a world W in which both IPK and my laptop are twice as massive as they actually are. In W my laptop is still twice as

¹⁹Of course (K) is also a singular fact, so if the results of the previous section are right we should really be grounding (K) by grounding the set of all singular facts. But let us put this complication aside for now and focus instead on the challenge of specifying a set S of facts that (K)—*qua* being a fact about mass-in-kilograms—is grounded in.

²⁰Rather than pick a particular object as one’s benchmark, another related approach is to pick a *kind* of object. For example, one sometimes reads that the kilogram is defined as being ‘the mass equal to that of $83\frac{1}{3} \times 6.022\,141\,79 \times 10^{23}$ atoms of carbon-12’ (see the Wikipedia entry under ‘kilogram’). This suggests the view that (K) is grounded in the fact

My laptop is $2 \times 83\frac{1}{3} \times 6.022\,141\,79 \times 10^{23}$ times more massive than an atom of carbon-12

This would still count as a relatively restricted view about the extent of the grounding set S. But everything I say in the about the view that makes reference to IPK applies just as much to these other kinds of restricted views too.

massive as IPK but, intuitively, it is 4 kgs (and therefore not 2 kgs) since it is twice as massive as it actually is. Since I am assuming that the grounded is necessitated by its grounds, this shows that (K) is not grounded in (I).

This argument should be reminiscent of Kripke's discussion of scales: he argued that it is a contingent fact that the standard meter is 1 meter long, and a natural consequence of his argument is that my being 1.83 meters tall is not necessitated by my being 1.83 times as long as the standard meter.²¹ The argument presented here is similar, but applied to kilograms instead of meters. I find the argument compelling but I admit that there are ways to reasonably resist it, so at the end of this section I will discuss some other arguments against the current view.

But before that, let me stick with the main thread and turn to the other extreme, in which S is so wide-ranging that it includes facts about how my laptop is mass-related to every single object in the entire universe. Since this set of facts will imply all facts about the mass-relations between all objects, we may concede that this would necessitate all facts about mass including (K)—indeed, it would be very natural for the comparativist to think this—but the trouble now is that S contains explanatorily irrelevant information. For example, S contains facts about how my laptop is mass-related to a particular electron 10 million light-years away, and intuitively this is entirely irrelevant to an explanation of (K). Think of it this way: if you were informed about how my laptop was mass-related to every *other* object in the entire universe, would you still be lacking any information needed to explain its being 2 kilograms? Intuitively not. Therefore, since I am assuming that all parts of a fact's ground must be explanatorily relevant, it follows that S does not ground (K).

We are faced with precisely the same problem as in the case of individualistic facts. In order to necessitate my laptop's being 2 kgs, S must be wide-ranging—perhaps it must include facts about my laptop's mass-relation to all the objects there are—but in order for all the members of S to be explanatorily relevant it must be restricted. The two constraints work against each other, and I submit that it is extremely unobvious whether they can be jointly satisfied. Of course, none of this amounts to a definitive argument that no such set exists, but I think it raises sufficient doubt.

More Work for Pluralism about Ground

I have been arguing that *if* we assume singularism about ground, the comparativist faces serious obstacles when she tries to ground kilogram facts in the comparative facts that she considers to be fundamental. But the situation changes quite dramatically if we are pluralists about ground, for in that case the comparativist can concede that (K) itself has no comparative

²¹See Kripke [11].

ground and yet insist that kilogram facts are grounded plurally.

How might the comparativist spell out this approach in detail? Here is one proposal. Let \mathbf{K} be the set of all kilogram facts and let \mathbf{R} be the set of all facts about mass-relations that the comparativist regards as fundamental (either ordinal mass relations or mass ratios, depending on the comparativist). Then she may simply propose that the members of \mathbf{K} are plurally grounded in \mathbf{R} . Call this a “structuralist” view about kilograms. It is easy to see how this thesis may be generalized to other scales and quantities such as pounds, miles, seconds and so on.

Structuralism avoids the worries raised above about the attempt to ground each kilogram fact in turn. For while it was implausible that (K) is grounded in \mathbf{R} —remember, the latter contains facts about how my laptop is mass-related to electrons 10 million light-years away which are intuitively irrelevant to explaining (K)—this complaint loses its force against the structuralist. After all, \mathbf{K} includes kilogram facts about my laptop *and* the electrons 10 million light-years away, so it is no surprise that facts about their mass relations are part of what explains \mathbf{K} ’s members! And while we objected to the suggestion that (K) is grounded in my laptop’s being twice as massive as IPK by pointing out that this latter fact does not necessitate (K), this objection also loses force against the structuralist, for it is not so implausible to think that \mathbf{R} necessitates \mathbf{K} . Indeed, since the structuralist is a comparativist she is likely to think in any case that any two worlds agreeing on \mathbf{R} will agree on all facts about mass. If there is a problem with that commitment then it is a problem with comparativism in general, but it is not specifically a problem with the structuralist thesis that the members of \mathbf{K} are grounded in \mathbf{R} . Therefore, structuralism neatly satisfies the joint constraint that the ground must both necessitate and be explanatorily relevant to what it grounds.

Structuralism can be seen as being a more radical departure from absolutism than traditional versions of comparativism. The absolutist, remember, thinks that kilogram facts are just facts about the intrinsic masses of things. Traditional comparativists deny this by trying to ground each kilogram fact in turn, trying to find a comparative aspect of the world that constitutes my laptop’s being 2 kgs. In contrast, there is a sense in which the structuralist does not make any sense of my laptop’s mass-in-kilograms: there is simply no part of the underlying facts about mass relations that is responsible for its being 2 kgs. She can of course make sense of all kilogram facts when taken together, but when it comes to my laptop’s mass-in-kilograms she finds that it has melted away into nothing more than a node in a complex web of kilogram facts.

Digression: More on the Restricted View

Earlier I gave a quick argument against the “restricted” view that (K) is grounded in (I). The argument was that (I) does not necessitate (K): a world W in which my laptop and IPK are both twice as massive as they actually are is a world in which (I) holds but (K) intuitively does not. But there are three objections to this line of argument.

The first is directed towards a comparativist but it appeals to a notion that comparativist’s may reasonably reject. To see this, note that I just described the W as being a world in which my laptop is twice as massive *as it actually is*, and therefore my description of W relied on describing how my laptop’s mass in W relates to its mass in the actual world. Call this an “inter-world mass-relation”. The problem is that the comparativist may reasonably refuse to make any sense of this. After all, she believes that the fundamental mass facts are all facts about how things are mass-related to one another, so if I ask of an actual object, my laptop, how it’s mass compares to an object in a *different* possible world, it is difficult to see how there could be a fact of the matter. Therefore, the comparativist who wishes to defend the view that (K) is grounded in (I) may reject the terms in which I just phrased my argument.²²

A second objection is that it is impossible for IPK to be twice as massive as it actually is, and that therefore W is impossible. The objection initially sounds implausible since it seems obvious that the lump of platinum-iridium alloy in Paris could have been constructed a little more massive than it actually is, but the objector continues by pointing out that the lump of platinum-iridium alloy is not IPK. The idea is that although they are co-located in space (and perhaps in time too), they are in fact distinct and have different modal profiles: while the lump could indeed have been more massive than it actually is, this objector claims that IPK has its mass essentially. Thus, IPK does not exist in W .²³

Finally, a third objection is to grant the letter of my argument but revise the “restricted” view slightly by building in an actuality clause, and say that (K) is grounded in my laptop’s being twice as massive as IPK *actually* is.

²²We might note that the absolutist has no problem recognizing inter-world mass-relations: for my laptop in w to be twice as massive as my laptop in actuality is just for it to have a certain absolute, intrinsic mass in w that is twice that which it has in actuality. Incidentally, I am not claiming that every comparativist will reject talk of inter-world mass-relations. For example, a comparativist who is also a modal realist in Lewis’ sense might be an exception. The modal realist believes that the fundamental facts about the world are actually facts concerning a plurality of possible worlds. She may therefore be a comparativist insofar as she believes that the fundamental facts about mass are comparative, but nonetheless think that some of those fundamental facts concern how objects in different worlds relate to one another in mass. Still, my point is that many comparativists will find it natural to reject inter-world mass-relations, so it remains that the argument I presented is not comprehensive.

²³Thanks to Jack Spencer for bringing this objection to my attention.

The existence of possible world W would not constitute an objection to this revised view.

I believe that all these objections can be answered, but unfortunately dealing with the first two would take us deep into the metaphysics of modality.²⁴ To keep things tractable, then, let me briefly outline two other arguments against the view that (K) is grounded in (I). Unlike my original argument, these arguments do not try to establish that (I) fails to necessitate (K), but instead try to motivate the idea that the IPK is completely irrelevant to an explanation of my laptop's being 2 kgs. For this reason, these arguments are equally effective against the view proposed in the last paragraph which builds in an actuality clause.

The first argument is based on the intuitive plausibility of the following counterfactual: that even if there were no lump of platinum-iridium in Paris, my laptop would still be 2 kgs. The truth of this counterfactual suggests that whatever it is that makes it the case that my laptop is 2 kgs, it has nothing to do with objects in Paris since my laptop would be 2 kgs no matter whether those objects exist. Now, I should stress that the truth of this counterfactual does not *imply* that (K) is not grounded in (I), for (as I said in Section 1) claims about grounds are contingent, so a theorist might in principle insist that my laptop's being 2 kgs is indeed grounded in its relation to IPK, but that if there were no IPK it would be grounded in something else. But this sounds rather *ad hoc*; at the very least, the burden of proof is now on this theorist to tell us whether there is anything systematic to say about what would ground (K) in different counterfactual situations including those in which IPK does not exist.

The second argument against the view that (K) is grounded in (I) is based not on counterfactuals but on counteractuals. To bring the counteractuals I have in mind to the fore, suppose we were to read in the Times tomorrow that there is in fact no lump in Paris—that the French government had been duping us with an elaborate system of lights and mirrors in some perverse attempt at a joke. Suppose the article detailed that the joke was systematically executed in such a way that whenever we thought we were

²⁴Very briefly: to answer the second objection one might reasonably contest the conception of co-location and essential properties it presupposes. And to answer the first, one might introduce the comparativist to a sort of “counterpart theory” for analyzing claims about how something's mass might have differed. Just as standard counterpart theory appeals to a counterpart relation between objects in different worlds that is not identity but stands in for it when evaluating *de re* modal claims, this analogue theory would introduce a mass-counterpart relation between objects in different worlds that is not the “same mass as” relation but stands in for it when evaluating claims about how things could have differed in mass. One can then describe W without describing any inter-world mass relations and yet argue that when we compare it with the actual world, the natural mass-counterpart relation is the identity map on all objects except for IPK and my laptop. As a result, W is correctly described as a world in which my laptop is 4 kgs and not 2 kgs, even though in W it is twice as massive as IPK.

using the IPK to calibrate various measuring instruments, we succeeded in calibrating the instruments even though there was in fact no such thing as IPK. For a second example, suppose we were to read another article again accusing the French of mass deception, but this time claiming that while there is such a thing as IPK it turns out that the French have been systematically misleading us into thinking that it is twice as massive as it actually is. As a result, it turns out that my laptop is actually 4 times more massive than IPK, not 2 times as previously thought. But again, according to this article the deception was systematic and all the measuring instruments we tried to calibrate with the help of IPK are indeed calibrated.

Now, if we believed either article, would we conclude that my laptop is not 2 kgs after all? In particular, would we respond to the second by concluding that it is actually 4 kgs? I think not. Instead, I think we would conclude in both cases that our system of measuring mass in kilograms has worked perfectly well despite the tomfoolery of the French; in particular, we would continue to believe that my laptop is 2 kgs and indeed that everything's mass-in-kilograms is exactly what we always thought it was.²⁵ These responses suggest the following counterfactual: that even if facts about the IPK turned out to differ in either of the ways stated in these articles, my laptop would still turn out to be 2 kgs. The truth of this counterfactual suggests that the IPK is simply not relevant to explaining what it is for my laptop to be 2 kgs, since our discoveries about the IPK simply seem to be irrelevant to whether we think my laptop is 2 kgs. Again, I should stress that this argument does not *imply* that (K) is not grounded in (I), for so long as there *is* such a thing as IPK and the French haven't been fooling us about its mass, a theorist might insist that my laptop's being 2 kgs is indeed grounded in its mass-relation to it, and that what this counterfactual shows is that if we read these articles in the Times we would revise our belief about what grounds what. But again, this sounds *ad hoc*; at a minimum, the burden of proof is now on this theorist to tell us something systematic about what we would think grounds (K) in various counterfactual situations.²⁶

²⁵Except the IPK, of course, which in the second case we would conclude is, surprisingly enough, only 500 grams. Therefore, one thing this thought experiment shows that Kripke's theory of reference-fixing for the term '1 kilogram' is false: it is not the case that it is introduced to refer to whatever mass is had by the IPK, since this is a case in which we rationally conclude that the IPK is not 1 kg. Consequently, I believe that the proposition that the IPK is 1 kg is not an example of the contingent apriori, contrary to what Kripke argued.

²⁶Compare this with the case of water. It is natural to think that facts about water are grounded in facts about H₂O, but we also accept the following counterfactual: if the stuff in rivers and streams turns out to be XYZ, then water will turn out to be XYZ. Now, we don't take the truth of this counterfactual to imply that water facts aren't grounded in H₂O facts. But this is because we have a systematic story to tell about our use of the word 'water' which is consistent with our belief about what grounds water facts and which also predicts the counterfactual. My point in the text is that the burden is now on the theorist who thinks that (K) is grounded in (I) to tell such a story in the case of kilograms.

If these arguments are persuasive, they show that facts about the IPK are simply irrelevant to explaining my laptop's being 2 kgs. Notice, therefore, that they tell equally against the original view under discussion, i.e. that (K) is grounded in (I), as they do against the modified version of the view on which (K) is grounded in my laptop's being twice as massive as it *actually* is.

4 Structural Explanations

So far I have outlined two structuralist views, one concerning individualistic facts and the other concerning kilogram facts. It will now be worthwhile considering a potential objection to both views, for seeing how to answer the objection will teach us about the nature of structural explanations. I will focus on the case of kilograms, but an analogous discussion could be had in the case of individuals.

The objection I have in mind is this. The set **K**, remember, is the set of all kilogram facts such as

Beckham is 75 kilograms

My laptop is 2 kilograms

My cup is 1/4 of a kilogram...

...and so on. The structuralist claims that the members of **K** are grounded in the facts in **R**, which are all the facts about mass-ratios such as

Beckham is 37 1/2 times more massive than my laptop

My laptop is 8 times more massive than my cup

My cup is 1/300th the mass of Beckham...

...and so on. But do the latter facts really explain the former? The problem is that it is not at all obvious whether the latter facts explain why my laptop is *two* kilograms rather than, say, *four*. Put otherwise: what is it about these underlying comparative facts **R** that make it the case that the facts **K** obtain rather than the following facts we will call **2K**:

Beckham is 150 kilograms

My laptop is 4 kilograms

My cup is 1/2 a kilogram...

...and so on, where here I have expressed these facts by simply multiplying all the numerals by 2 (and therefore the mass-ratios between everything remains the same).

Note that the objection is not that the structuralist fails to explain why the numeral ‘2’ rather than ‘4’ is used to refer to my laptop’s mass-in-kilograms: it is true that the structuralist does not explain this, but then structuralism was never advertized as explaining linguistic facts about reference. Nor is the objection that, intuitively, everything’s mass could be double what it actually is and yet the structuralist cannot make sense this. It is true that the structuralist cannot make sense of this possibility, but neither can *any* comparativist view. Instead, the objection I have in mind is specific to the structuralist version of comparativism, and complains that according to our natural grasp on the notion of a kilogram, there is something more to my laptop’s being 2 kgs, Beckham’s being 75 kgs, my cup’s being 1/4 of a kilogram, and so on, than just the comparative mass relations between them.

The structuralist might respond to this objection by trying to account for the intuition driving it on her own terms. For example, she might point out that it is certainly intuitive that my laptop’s being 2 kgs is not explained by the underlying comparative facts, and that Beckham’s being 75 kgs is not explained by them either, and so on for each member of \mathbf{K} . That much behind the objection is correct, the structuralist might concede, but to run the objection one must infer on the basis of these intuitions that those facts *taken together as a plurality* are not explained by the underlying comparative mass facts either; and that inference, the structuralist will point out, is valid only on the singularist notion of ground. In this way she might explain away the intuition driving the objection as arising from a mistaken view about the nature of grounds.

The objector may respond that the driving intuition need not rest on the inference just mentioned. Instead, she may say that the intuition is simply that \mathbf{K} is distinct from $2\mathbf{K}$, and that merely appealing to facts about mass relations does not explain why \mathbf{K} obtains while $2\mathbf{K}$ does not. But the structuralist will simply deny their distinctness, and will again explain away the intuition of distinctness on her own terms. This time, she will accuse the intuition of resting on the idea that my laptop’s being 2 kgs is different from its being 4 kgs, that Beckham’s being 75 kgs is different from his being 150 kgs, and (likewise) that each member of \mathbf{K} is different from its counterpart in $2\mathbf{K}$. From these premises, the structuralist claims, the objector infers that \mathbf{K} is different from $2\mathbf{K}$. But for the structuralist, reasoning like this gets the cart before the horse. Since she thinks that kilogram facts are *plurally* grounded in comparative facts, she will insist that the primary objects of comparison are not each member of \mathbf{K} and its counterpart in $2\mathbf{K}$, but \mathbf{K} itself, considered as a plurality, and $2\mathbf{K}$ considered likewise; and when considered like this, the structuralist will say that \mathbf{K} and $2\mathbf{K}$ are in fact identical. Comparisons of sameness or difference between members of the groups must then be based on their respective role in each group. Thus, she will claim that my laptop’s being 2 kgs in \mathbf{K} is the same as its being

4 kgs in $\mathbf{2K}$, it's just that the very same fact is expressed in two different scales (with the confusion arising only because we used the same expression, 'kilograms', for both scales). So the intuition driving the current objection is mistaken, the structuralist will claim, because it ignores the correct standard of sameness and difference.

Each time the objector tries to make her objection precise, it turns out to rest on an assumption that the structuralist denies. Still, it should be admitted that there is a lingering feeling that the structuralist has not really explained \mathbf{K} after all. So it would be nice if the structuralist could provide a positive reason to think that the underlying comparative facts really do explain everything there is to explain about kilogram facts. I will briefly outline one such reason here.

To start, let me review some basic measurement theory.²⁷ Consider a language that doesn't contain kilogram predicates. In this language, the only predicates with which to talk about mass express mass-ratios of the form ' x is r times more massive than y ', one such predicate for each real number r . Now imagine a set of axioms strong enough to imply all the truths we take to be analytic of mass-ratio. A *representation theorem* then says that for any model of the axioms, there is a mapping m from elements of the model to the real number line such that $m(x) = r.m(y)$ if and only if x is r times more massive than y , for any positive real r . Such a mapping is said to "represent" the underlying mass-ratios. (I'm simplifying here: usually the original language is taken to contain a much sparser stock of predicates, but the details don't matter for our purposes). Clearly, there'll be many different functions fitting that bill. This is summed up by the *uniqueness theorem*, which states that if m is a function that represents mass-ratio then (i) so is $r.m$, for any positive real r ; and (ii) every function that represents mass-ratio can be written in the form $r.m$, for some positive real r .

So far, nothing has been said about how kilograms fit in here. But we can think of the kilogram scale as being one such mapping m . Seen like this, the comparativist will naturally view kilogram predicates of the form ' x is r kilograms' as being nothing other than a convenient device with which to represent to ourselves the underlying mass-ratios. Now, what property do kilogram predicates need to have, in order for them to do this? Well, look at the left-to-right direction of the representation theorem: it appears that in order to represent mass-ratio, they just need to have the property that when we apply them to two things, we are then in a position to infer the mass-ratio between them. More precisely, we just need to ensure that we use them in such a way that when we have judged

(1) a is r kilograms

and

²⁷I'll be *very* sketchy here: details can be found in Krantz *et al* [10].

(2) b is s kilograms

we are then in a position to infer

(3) a is r/s times as massive as b

If kilogram predicates have this property, call them “coordinated”.

Now, what strategy could a community adopt, in order to ensure that their kilogram predicates are coordinated? One strategy is to define kilogram predicates in relation to IPK. For example, one might introduce the predicates as being defined as follows:

(D) x is r kilograms iff x is r times as massive as IPK

Defining the predicates like this would indeed ensure that the predicates are coordinated.²⁸ And if we had defined the predicates like this, then it would be extremely plausible that the fact expressed by ‘My laptop is 2 kgs’ is grounded in (or even identical to) my laptop’s being twice as massive as IPK. But, as a matter of fact, we don’t use kilogram predicates this way. As Kripke famously argued, we intuitively think that the IPK might have been 2kgs, for example if it had been constructed with twice the matter than it actually was, which shows that the two sides of the above definition are not necessarily equivalent.²⁹

So, what strategy have *we* adopted, in order to ensure that kilogram predicates are coordinated? I think we simply used the predicates in such a way that the inference from (1) and (2) to (3)—let us call it the “kilogram inference”—is analytic, i.e. truth-preserving in virtue of the meanings of the predicates. No mention here of the IPK or any other benchmark object: we simply introduced the predicates with the stipulation that whatever they mean, the kilogram inference is to turn out truth-preserving. Now suppose, just for a minute, that this is the *only* meaning constraint on kilogram predicates. I will argue that if this supposition is granted, it is extremely plausible that the facts we express with kilogram sentences like ‘My laptop is 2 kgs’—i.e. kilogram facts—are facts which have comparative grounds when taken as a plurality but not when taken on their own, just as the structuralist asserts. In particular, on this supposition it is extremely plausible that **R** does indeed explain everything there is to explain about the members of **K**.

Notice first that, in contrast to definition (D), this meaning constraint does not fix truth-conditions, stated in terms of mass-ratios, for the sentence ‘My laptop is 2 kgs’. This is not to say that the sentence lacks truth-conditions at all, for it is consistent with the picture I am about to describe that it has truth-conditions which can be stated in terms of kilogram-predicates or indeed in terms of other scales. For example, the

²⁸This sort of definition can be found in Field [6].

²⁹See Kripke [11].

truth-condition of ‘My laptop is 2 kgs’ might be expressed as the condition that my laptop is 2 kgs, or 2.2 pounds, and so on. At issue here, though, are truth-conditions stated in terms of mass-ratios, and the meaning constraint under consideration does not appear to fix any. However, the meaning constraint *does* fix truth-conditions, stated in terms of mass-ratios, for pluralities of kilogram sentences taken together: *they* are true if and only if the mass-ratios between objects agree with those that follow from the sentences by way of the kilogram inference. Individual kilogram sentences can then be said to have truth-conditions stated in terms of mass-ratios in a derivative sense, i.e. relative to pluralities of which they are members. Therefore, from the perspective of mass-ratios there is a sense in which attempting to speak truly, when applying a kilogram predicate to an object, boils down to attempting to make one’s claim cohere with other claims about mass-in-kilograms.³⁰

Now, this semantic picture of kilogram sentences strongly suggests that the facts they express—kilogram facts—are plurally, and not singularly, grounded in the comparative. Why? Well, since (on this picture) the sentence ‘My laptop is 2 kgs’ does not have truth-conditions statable in terms of mass-ratios when considered on its own, it is extremely plausible to think that the fact it expresses—the fact that my laptop is 2 kgs—has no comparative grounds when considered on its own either. On this picture, that is, there simply is nothing about the mass-ratios between things that make it the case that the fact expressed by the sentence holds. But since (on this picture) pluralities of kilogram sentences have truth-conditions stated in terms of mass-ratios when taken together, it is plausible to think that the facts they express—pluralities of kilogram facts—have comparative grounds when taken together too. As a result, on this picture of what we *mean* by kilogram predicates, it should be utterly unsurprising to hear that what is responsible for the obtaining of the facts expressed by those sentences—my laptop’s being 2 kgs, Beckham’s being 75 kgs, my cup’s being 1/2 kg, etc—is simply the underlying mass-ratios between them. So this is one way that the structuralist might argue that **R** really does explain all there is to explain about the facts in **K** after all.

I should stress that our excursion into language is not strictly speaking part of the structuralist’s view. Structuralism, remember, is the non-

³⁰Bathroom scales help with this, for they are nothing other than machines designed to have the following property: that in normal conditions, it follows from the laws of nature that if an object x causes the instrument to give the reading ‘ r kgs’ and an object y causes the instrument to give the reading ‘ s kgs’, then x is r/s times as massive as y . If we use a machine with this property when applying kilogram predicates to things, then our kilogram claims are likely to cohere in the right way. Of course, we actually use many such machines, so we make sure that they are calibrated together. Benchmark objects such as IPK help for this purpose. This is the role of benchmark objects, on this view: they are not used to define kilogram predicates or to fix their reference, they are simply used to make sure that our kilogram claims cohere. I hope to expand on these ideas elsewhere.

linguistic view that there is a set of facts whose members are plurally grounded in the comparative even while none has a comparative ground on their own. I am discussing the role of kilogram-predicates here just to lend plausibility to her view that the members of \mathbf{K} are explained by \mathbf{R} : for once she describes the function of the kilogram-predicates used to express the facts in \mathbf{K} (to represent mass-ratios), and the way in which they fulfill that function (our requirement that the kilogram inference is analytic), it becomes awfully plausible that the facts they express—kilogram facts—are (plurally) grounded in mass ratios even while each fact lacks a comparative ground on its own.

Of course, all this supposes that making the kilogram inference truth-preserving is the only meaning constraint on kilogram predicates. No doubt I am simplifying greatly, and no doubt the supposition is not entirely accurate, but I think it is close enough to a core feature of our actual use to be illuminating, and in particular to make plausible the structuralist’s suggestion that \mathbf{R} explains \mathbf{K} .

In this section I have discussed the case of kilograms, but I would argue that the same goes for individuals. Just as we can see kilogram predicates as devices of measurement whose function is to represent underlying mass-ratios, so too we can see the singular terms with which we express individualistic facts as “devices of measurement” whose function is to represent the underlying qualitative world. These singular terms are not (usually) introduced by definition. Instead, we use them in such a way that certain inferences from claims containing singular terms to claims about the qualitative world are analytic (the rule of existential elimination is a classic example of this sort of inference.) But this is not the place to expand on these ideas.³¹

5 The Importance of Pluralism

So far I have argued for two conditional claims: that if qualitavism is true then individualistic facts are plurally, rather than singularly, grounded in the qualitative; and that if comparativism is true then kilogram facts are plurally, rather than singularly, grounded in the comparative. For qualitavists and comparativists, this amounts to an argument that there are indeed actual examples of plurally grounded facts. For other theorists my claims imply no such thing, since they are both conditional. But even for them, I hope to have shown that grounding these facts plurally is at least a possibility.

Now, it would be tempting to think that for these latter theorists, the “mere” possibility of plural grounds is just a curiosity. But in fact it is no such thing: simply acknowledging the possibility of plural grounds is enough

³¹They are developed to some degree in Dasgupta [5].

to have a significant impact on a number of debates in metaphysics. For example, a common way to argue that a particular fact is fundamental is to argue that it has no ground. But with the possibility of plural grounds on the table it is clear that this line of reasoning is invalid, since a fact with no ground may nonetheless be part of a plurality with a ground, in which case it would be a mistake to conclude that it is fundamental.

It would be interesting to chart out the ways in which this sort of mistake has infected the metaphysics literature, but obviously there is no space to do this here. Instead, I will finish by discussing this mistake in the literature on individuals. The upshot will be this: there are a number of influential arguments against qualitivism and in favor of individualism that would all be extremely compelling on the assumption that ground is always a singular relation but which collapse once the possibility of plural grounds is recognized. I will discuss three such arguments here. While I said at the outset that I would not attempt to motivate qualitivism in this paper, this will provide some defense of the view.

The first argument is not widely discussed in the literature (not to my knowledge, anyway), but my guess is that it is at the back of many people's minds when they judge qualitivism to be implausible. Indeed, it is implicit in the above discussion in which we failed to find a qualitative ground for Obama's existence. For on a singular notion of ground, the existence of an individualistic fact with no qualitative grounds would seem to imply that the fundamental facts of the world include such individualistic facts, contrary to what the qualitivist states.

Now, this argument against qualitivism needs tidying up. For one thing, even if we grant that Obama's existence has no *qualitative* ground it remains open that it is grounded in individualistic facts about the existence of the particles that compose him. However, as I said earlier it is plausible that the same sort of reasoning we rehearsed above concerning Obama's existence will convince us that those other individualistic facts lack qualitative grounds too. So the objection to qualitivism I have in mind is perhaps better represented like this:

- (1) There are examples of individualistic facts (e.g. facts about the existence of particles) which have no qualitative and no individualistic grounds.
- (2) Therefore, these individualistic facts are fundamental.

Now, even on a singular notion of ground the inference is not yet valid. To patch it up, we need to add two auxiliary assumptions: that all fundamental facts are either individualistic or qualitative (to preclude the possibility that the individualistic facts in question are ultimately grounded in some other kind of fact altogether), and that there is a fundamental level (to preclude the possibility that there are no fundamental facts in the first place). But

what I want to point out is that even with these auxiliary assumptions granted, the argument from (1) to (2) is valid only if the following principle is true:

FUNDAMENTAL (STANDARD): An aspect of the world is fundamental if and only if it has no ground.

This connection between fundamentality and ground is naturally suggested by a singularist view of ground, and indeed it is explicitly endorsed by many writers.³² But if ground is plural then the principle is false and the correct principle is

FUNDAMENTAL (PROPER): An aspect of the world is fundamental if and only if it is not a member of any plurality with a ground.

And if this is the correct link between fundamentality and ground, then even with the two auxiliary assumptions in hand the inference from (1) to (2) is invalid. Failing to recognize the possibility of plural grounds can therefore mislead one into thinking that a given aspect of the world is fundamental (since it has no ground), when in fact it is not.

The second argument against qualitatism I want to discuss has been extremely influential, and finds a good statement in Adams' classic paper on this topic. Adams' argument is based on the possibility of what is known as a "Max Black world", a world containing just two spheres of iron located 2 miles apart. The spheres are stipulated to share all their qualitative properties: they are of exactly the same mass, color, shape and so on.

Many theorists find it intuitively plausible that such a world is possible, and Adams argues persuasively that it is (more on which below). For now, let us assume that it is possible and ask how this can be used to argue against qualitatism. The argument against the traditional Bundle Theorist is straightforward. On that view, each sphere is *identical to* the collection of its qualitative properties, but since both spheres share their qualitative properties it follows that they are identical, contrary to stipulation.

But as we saw earlier, the Bundle Theory is just one incarnation of qualitatism, and it is worth asking if and how the possibility of Max Black worlds militates against qualitatism more generally. Remember, qualitatism is the conjunction of two claims: (1) a claim about the fundamental nature of the world, namely that it is qualitative; and (2) a claim about what grounds what, namely that the individualistic is grounded in the qualitative. Which claim does the possibility of a Max Black world put pressure on? It is tempting to think that the possibility of a Max Black world militates against (1). The idea is that if one thinks that the fundamental nature of the world is purely qualitative then one has no resources to characterize a world with two qualitatively identical things. But this is incorrect, for if we

³²See e.g. Schaffer [16].

let the predicate F expresses the conjunction of qualitative properties had by each sphere, then the qualitavist can characterize the Max Black world as being one in which the fundamental facts include

$$(\exists x)(\exists y)(Fx \ \& \ Fy \ \& \ x \neq y)$$

Since this is a qualitative fact, the qualitavist can perfectly well make sense of the possibility of a Max Black world.

The better argument targets claim (2): the charge this time is that the possibility of a Max Black world shows that the individualistic is not grounded in the qualitative. This argument is what Adams seems to have had in mind when he wrote, just before using Max Black worlds to argue against qualitavism, that

... the clearest way of proving the distinctness of two properties is usually to find a possible case in which one would be exemplified without the other. In order to establish the distinctness of thisnesses [i.e. individualistic properties] from all suchnesses [i.e. qualitative properties], therefore, one might try to exhibit possible cases in which two things would possess all the same suchnesses, but with different thisnesses.

Let us label one of the spheres A and the other B . Put in terms of properties, Adams' observation seems to be that A and B share their qualitative properties and yet sphere A has an individualistic property that B lacks, namely the property of being identical to A . This suffices to show that the latter property is *distinct from* any of A 's qualitative properties. To argue that the property of being identical to A is *not grounded in* any of A 's qualitative properties, we just add the plausible assumption that if a property P is grounded in property Q , then necessarily anything with Q also has P .

That is the argument put in terms of properties, but since we have been working with facts let us translate it into those terms. This is not an entirely straightforward matter, but a first stab would go something like this. Consider the fact that A exists and the fact that B exists. In what might each of these be grounded? If A 's existence is grounded singularly, there must be some fact about the distribution of qualitative properties that explains A 's existence; and likewise for B . But, one would argue, the qualitative facts that explain A 's existence must be different from those which explain B 's, else there would be no account of their distinctness. Now, logically speaking there is as yet no problem: since both spheres have many qualitative properties, one could, at least in principle, say that A 's existence is explained (say) by something's being iron and spherical, and that B 's existence is explained (say) by something's being black and hard. But the trouble is that this would be utterly implausible: since A and B share all their qualitative properties, it would be a mystery why being black

and hard explains B's existence but not A's. The argument is therefore slightly different than that which was run against the traditional Bundle Theory. In that case, the Bundle Theory *logically implied* that the spheres were identical, contrary to hypothesis. In this more general case there is no such implication; instead, the charge is now that there is no plausible explanation of their existence. Still, even in its more general form, the argument is compelling.

Now, it is very natural to think that in order to respond to this argument the qualitivist must deny that Max Black worlds are possible. Indeed, there is an implicit assumption in the literature that this is the case. For one thing, Adams devotes a large proportion of his time arguing that Max Black worlds really are possible and almost no time at all defending the claim that *if* they are possible then qualitivism is false, which he takes to be evident. And for another thing, the literature contains many examples of theorists with qualitivist inclinations who try to defend the idea that Max Black worlds are impossible. Hacking, for example, argues that a Max Black world can be re-described as a world in which there is just one sphere situated in a non-Euclidean space so tightly curved that it is 2 miles from itself, and he argues that we have no reason to prefer the original description over the re-description.³³ And Hawthorne argues that individuals can be multiply located in space, so that the Max Black world can be re-described as a Euclidean world in which a single individual A is located 2 miles from itself.³⁴

All these theorists seem to agree, then, that if Max Black worlds are possible then qualitivism is doomed. But the possibility of plural grounds shows that this shared assumption is wrong. Even if we grant the possibility of Max Black worlds, all Adams' argument (or, rather, our generalized version of it) shows is that neither A's existence nor B's existence has a qualitative ground on its own. But to infer that A's existence is a fundamental aspect of the world and that qualitivism is false, one needs to assume a singularist notion of ground on which if A's existence has no ground on its own then it isn't grounded at all. However, the possibility of plural grounds shows that the inference is invalid. For even if Adams is right that A's existence has no qualitative ground, it remains open that A's and B's existence are plurally grounded (along with the other individualistic facts) in the qualitative nature of that world, in just the way that the structuralist describes. As a result, the qualitivist may in fact concede the lion's share of Adams' argu-

³³See Hacking [8].

³⁴See his [13], originally published under the name 'O'Leary-Hawthorne'. His strategy is not as crazy as it might sound. In his paper he is defending a version of the Bundle Theory on which individuals are composed entirely out of *immanent universals*. But an immanent universal is something that can be wholly present in different places: if redness is an immanent universal, then the redness of my apple in New York is numerically the very same thing as the redness of a phone booth in London. Therefore, this version of the bundle theory should be *expected* to think that individuals can be multiply located.

ment by conceding the possibility of a Max Black world, without worrying that this causes problems for her view.

This is a nice result for the qualitatist, because Adams has an argument that they are possible to which neither Hawthorne nor Hacking respond. His argument is from the possibility of *almost* indiscernible spheres: surely no one will deny that it is possible for there to be just two spheres that are qualitatively indiscernible save for the fact that one is, say, 1 gram more massive than the other. And surely no one will deny that, in such a world, it is possible for the more massive sphere to be 1 gram less massive. From these premises, one may argue that it is therefore possible for two spheres to be qualitatively indiscernible. Now, if ground were always a singular relation qualitatists would have to respond to this argument, since conceding the possibility of a Max Black world would be potentially devastating for her view. But once we recognize the possibility of plural grounds we see that the qualitatist can concede the argument and yet deny that the possibility of Max Black worlds spells trouble.

The third and final argument I want to discuss is found a little later in Adams' paper, in which he argues that if Max Black worlds are possible then a doctrine known as "haecceitism" is true. For the purposes of this paper, I will take haecceitism to be the thesis that there are examples of individualistic differences between worlds which agree on all their qualitative facts.³⁵ Now, Adams did not present this as an argument against qualitatism since he took himself to have already refuted that view with the argument discussed above. But I take it that if haecceitism is true then qualitatism is false, for the qualitatist lacks the resources to make sense of a difference between qualitatively identical worlds. As a result, we may take this to be a third argument against qualitatism.

The argument is this. In the Max Black world, it seems possible for sphere A to be destroyed at some future time t while B survives. It also seems possible for sphere B to be destroyed at t while A survives. And it seems like these are distinct possibilities. (To motivate this last thought, just imagine that you live on sphere A and your qualitative duplicate lives on sphere B: you would surely care greatly which possibility will obtain!) But if these are distinct possibilities, the argument is, one can infer that there are *two* qualitatively identical possible worlds in which there are initially two qualitatively identical spheres one of which is destroyed at t ; hence haecceitism is true.

How should the qualitatist respond? One response is to deny the final inference by invoking counterpart theory. On this view, objects come to have modal properties by being represented *in absentia* by other objects in other possible worlds. For example, a counterpart theorist would say

³⁵The term is defined in many different ways in the literature, but this is the thesis of relevance to us here.

that sphere A is possibly destroyed at t in virtue of being represented by a distinct object C in another world, one that resembles it in various ways but is destroyed at t ; *mutatis mutandis* for sphere B. Importantly, this view allows that the object C that represents A's being destroyed is one and the same thing that represents B's being destroyed. As Lewis put it, we have 'one possible world, two possibilities'; the two possibilities arising from the fact that C can be taken to represent A when we are thinking about the possibility of A's destruction and B when we are thinking about the possibility of B's destruction.

Now, it is all very well saying that counterpart theory can make sense of these possibilities, but is counterpart theory available to the qualitativist? Unfortunately, there is a danger that it is in fact an inconsistent addition to her view (or, at best, an extremely odd and *ad hoc* addition). To see this, consider the Bundle Theorist who identifies individuals with bundles of qualitative properties. If we assume that qualitative properties themselves can be parts of different worlds (something accepted by many), then a possible world W that contains the bundle of (say) Obama's qualitative properties is *ipso facto* a world that contains Obama. The Bundle Theorist would therefore appear forced to deny counterpart theory and say that Obama is represented in W by himself; or, at a pinch, conjure up an extremely odd theory on which Obama is represented in W by something else even though he himself exists there. Hawthorne and Cover accept the latter disjunct, but it feels like an unhappy concession.³⁶

However, things are very different for the structuralist. Far from being an inconsistent addition to her view, counterpart theory is almost enforced. Why? Well, since the structuralist grounds each world's collection of individualistic facts in its complete qualitative nature, the fact that the grounded is necessitated by its grounds only forces her to say that qualitatively identical worlds agree on their individualistic facts. But since the structuralist is a qualitativist, she will naturally identify qualitatively identical worlds and will therefore never be forced to identify individuals in different possible worlds. Indeed, for the structuralist it would be odd to make any such identification, for if we consider a world W qualitatively distinct from ours and ask whether it contains Obama, it is hard to see what could possibly settle the issue: on the structuralist's view there really is nothing it is to be Obama, so there is no aspect of W that would settle the question of whether it is a world containing Obama. Because of this, it is overwhelmingly natural for the structuralist to say either that each world contains a distinct set of individuals or that there is no fact of the matter as to the identity or distinctness of individuals across different possible worlds. And if they say this, then the only way Obama can be represented in W as (say) losing the election is to be represented *in absentia*, just as the counterpart theorist

³⁶See their [14], with Hawthorne again publishing under the name 'O'Leary-Hawthorne'.

asserts.

The result is this: the third argument against qualitavism can be refuted by adopting counterpart theory, but counterpart theory is not available to many qualitavists. However, if the qualitavist is a structuralist, then counterpart theory is almost enforced. Therefore, the mere possibility of plural grounds and the structuralist view it engenders means that this argument against qualitavism is not persuasive.

6 Conclusion

I started by distinguishing a plural conception of ground from the more traditional singular conception. With pluralism on the table, I went on to show that if certain assumptions about the fundamental nature of the world are granted it becomes plausible to think that individualistic facts and kilogram facts are both grounded plurally, rather than singularly. Finally, I argued that the mere possibility of plural grounds has a significant impact on the debate between an individualist and a qualitavist, in favor of the latter.

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