The Fundamental Facts Can Be Logically Simple

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Abstract: I like the view that the fundamental facts are logically simple, not complex. However, many philosophers argue that some universal generalizations and negations are fundamental, because—allegedly—they cannot be explained by logically simple facts about particulars. I defend a natural response: what explains those universal generalizations and negations is that certain facts—call them $\phi\phi$—are the fundamental facts. I argue that this solution is only available given some metaphysical frameworks, some conceptions of metaphysical explanation and fundamentality. First it requires a ‘fitting’ framework, according to which metaphysical theories explain the aptness of representations in terms of how things are fundamentally. This refines how we conceive of “the fundamental facts”. Second we must take as primary a plural notion of the fundamental facts, not a singular notion of a fundamental fact. A metaphysics that ‘grounds’ facts is incompatible with my strategy for keeping the fundamental facts logically simple.

Keywords: fundamentality, negative facts, metaphysical explanation, grounding, truthmakers.

1. How can the fundamental facts all be logically simple?

I like the view that the fundamental facts are logically simple, not complex. They are particular, not quantificational, and contain no logical connectives like conjunction or even negation. Maybe there are fundamental facts like: quark $q_1$ is 95m from quark $q_2$. But there are no fundamental facts like: every quark is within 100m of another one. Nor

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1 Russell (1918) calls logically simple facts ‘atomic’. It would be misleading to express my view by saying that ‘the fundamental facts are atomic’: I will endorse a significantly holistic view. Sider (2011: 203–6; 2020: 38–9) calls the view that the fundamental facts are all logically simple ‘Tractarianism’, after Wittgenstein (1921/1974).
like: *it is not the case that* quark $q_1$ is 96m from quark $q_2$. Logical notions do not appear in the fundamental facts.²

The logic-free view of the fundamental facts is attractive. We can bring out its appeal as follows (taken literally or not). When God created the world, she gave the fundamental objects certain fundamental properties and relations, and then she stopped. She did not need to add conjunctive and disjunctive facts, on top of the logically simple facts she’d created. She did not need to add facts about things lacking properties; she merely refrained from giving those things the relevant properties. She did not need to add fundamental facts about what all the objects of some kind are like; she just gave each of those objects the relevant property. She did not need to add a final fundamental fact that there are no further ones; she merely desisted from further creation. She did not need to add the quality of fundamentality to certain facts; she merely put the relevant facts in place and then stopped.³

This paper focuses on the claims that negations and universal generalizations are never fundamental facts. Negations and universal generalizations are facts about absence, and God did not have to create fundamental facts about absence. Consider negations. There are certain fundamental fields over the points of spacetime, and an absence of any further ones. God did not have to create these absences; she merely created some fields and then stopped. That is, there are no fundamental facts of the form: *it is not the case that* spacetime point $a$ has alien field value property $F_v$. Universal generalizations are another kind of fact about absence—the absence of counter-examples. Intuitively, God could rest once she had given each object the relevant property; she did not have to add to the world the absence of further objects (that might have lacked the property). Facts about absences are ‘negative facts’, to be contrasted with ‘positive facts’, in the standard terminology (due to Russell [1918]). The fundamental facts are positive not negative, intuition insists. Thus negations and universal generalizations are not fundamental facts.

There is a wrinkle with pumping intuitions about the fundamental facts by considering what God had to put in place to create the universe. Some metaphysical

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² This paper does not address whether there are fundamental facts about identity. My (MS) argues that there are not.

³ Heil (2006) champions these intuitions.
views allow us to neatly identify the fundamental facts with those God put in place. But that isn’t right if God put in place the initial conditions of the universe and the laws of nature, and then let the laws generate all that followed. This metaphysical picture complicates the relationship between the fundamental facts and those God put in place, in two ways. First, God only put the fundamental initial conditions in place, but there are fundamental facts about how things are at later times too. Still, if the fundamental facts about the initial conditions are logically simple, then so are the fundamental facts about later times. Second, the intuitions concern only the fundamental initial conditions, not the laws of nature. Plausibly, the laws of nature are that certain universal generalizations hold. So if there are fundamental facts about the laws, those fundamental facts are plausibly logically complex. Let’s put aside the laws of nature, and focus on the fundamental non-nomic facts—they are logically simple, I claim. Regardless of how one thinks of the laws, it seems that accidentally true universal generalizations are not fundamental facts, nor are negations.

Another reason to keep the fundamental facts logically simple is to avoid a disconcerting choice between redundancy and arbitrariness (Sider 2011: 216–222, McSweeney 2019). If quantifiers and sentential connectives feature in the fundamental facts, which ones do so? The first order quantifiers \( \forall \) and \( \exists \) don’t mean the same thing, but they are inter-definable. It would be strange to think that both \( \forall \) and \( \exists \) feature in the fundamental facts as distinct, fundamental elements. It would also be strange to hold that one quantifier is metaphysically privileged (and presumably we could never know which). Similarly, it would be strange to metaphysically privilege some truth-functional sentential connectives, and strange to avoid privileging some by holding that they all feature in

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\(^4\) Maudlin (2007) and Loewer (2012) discuss these issues about the laws of nature and the putative passing of time.
fundamental facts. A simple way out of these dilemmas: no quantifiers and no sentential connectives feature in the fundamental facts.

We’ve seen enough to motivate our investigation: let’s try to keep logical notions out of the (non-nomic) fundamental facts. The puzzle is that there is a potent argument that some logically complex facts are fundamental. This argument traces back to Bertrand Russell (1918). Allegedly, logically simple fundamental facts about particulars cannot make a universal generalization true, because the facts about particulars don’t rule out the existence of a further object that’s a counter-example. Suppose that there are fundamental facts about particular quarks and their positions. Suppose that every quark is within 100m of another one. That fact is logically complex, and so should be non-fundamental, on the view I want to defend. But here’s the problem. The facts about how particular quarks are arranged—such as that quark $q_1$ is 95m from quark $q_2$—do not preclude there being another quark, as yet unmentioned, that is over 100m away from all the rest. The positions of $q_1, q_2, \ldots, q_n$ don’t settle that those are all the quarks. So it looks

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5 Eighteen pairs of (at most) binary truth-functional connectives are minimally expressively adequate, including \{’$\neg$', ‘$\&$’\} and \{’$\rightarrow$, ‘$\leftrightarrow$’\}. Two binary connectives are individually expressively adequate: NAND (the ‘Sheffer stroke’) and NOR.

6 Another way out: “$\forall x (Fx)$” and “$\neg \exists x (\neg Fx)$” both metaphysically perspicuously represent the same fundamental fact. Sider (2020, chapter 5) investigates this strategy. It is not open to Sider, for whom fundamentality applies directly to ‘sub-propositional’ elements such as $\forall$ and $\exists$ (Sider 2011: 128, 217).

7 Sider argues that since our best scientific theories are framed in a language of first-order logic, we should accept that the relevant logically complex facts are fundamental (2011: 188, 216; 2020: 42). This argument assumes that logically complex scientific facts are metaphysically fundamental, but that’s what needs to be shown.

like non-quantificational fundamental facts cannot explain why every quark is within 100m of another one. Rather, it is alleged, we must countenance fundamental quantificational facts. To vary the example: facts about \( q_1, q_2, \ldots, q_n \) can explain why there are at least \( n \) quarks, but they can’t explain why there are no more than \( n \) quarks. Allegedly, that fact must be fundamental.

Similarly, it looks like some negations cannot be metaphysically explained, and are thus fundamental facts. What metaphysically explains why spacetime point \( a \) lacks alien field value property \( F_v \)? It is hard to see what could.\(^9\) So, allegedly, \( \neg F_v \, a \) must be among the fundamental facts.

The cases of universal generalizations and negations are deeply analogous. They are both kinds of facts about absences, which accounts for the urge to exclude them from the fundamental, and the problem with doing so. On the one hand, it seems that fundamental reality consists only of ‘positive’ facts: that fundamental objects have certain fundamental properties and relations. God did not have to add in by hand the absence of further properties, nor the absence of further individuals that are counter-examples to a given universal generalization. On the other hand, the difficulty with explaining universal generalizations and negations is at bottom the same. The positive facts cannot metaphysically explain absences, whether of an individual or of an individual’s having a property. We should look for a unified treatment of the two cases.

Wittgenstein had the right instinct. The first page of the *Tractatus Logico-Philosophicus* suggests an answer (Wittgenstein 1921/1974).

1.11 The world is determined by the facts, and by their being *all* the facts.
1.12 For the totality of facts determines what is the case, and also whatever is not the case.

\(^9\) See Molnar (2000: 74–5), Armstrong (2004: 62–3), Dodd (2007: 387). They rebut the following inadequate suggestion: a thing’s fundamental qualities explain why it doesn’t have incompatible fundamental qualities. For example, that \([a \text{ has mass } 1\text{kg}]\) explains why \([a \text{ does not have mass } 2\text{kg}]\). This doesn’t work for all absent properties. In particular, the fundamental facts are compatible with the presence of extra fields over spacetime.
The suggestion is that what explains the truth of universal generalizations, and negations, is that the fundamental facts are what they are. Some notation helps. Some facts are the fundamental facts—call them ‘φφ’. Standardly, a double letter designates some things, to contrast with one letter designating one thing.10 ‘φφ’ does not objectionably reify those facts: it is a higher-order expression, not of the same linguistic kind as terms designating some objects (such as some quarks). Heuristically, think of ‘φφ’ as replacing a list such as: [quark q₁ is 95m from quark q₂], [object e has quality Q], …. (I use square brackets simply as punctuation to aid legibility, not as a term-forming operator.) If there are uncountably many fundamental facts, they won’t be listable; thinking of a list just reveals that ‘φφ’ does not reify facts. We can now state a Wittgensteinian suggestion: that φφ are the fundamental facts explains why [every quark is within 100m of another one], and why ¬Fvα. Plausibly, that φφ are the fundamental facts settles that there are no more quarks and no more fundamental fields than those φφ concern.

The suggestion strikes me as on the right lines, but it immediately runs into trouble. Call the fact that φφ are the fundamental facts ‘the totality fact’. The strategy is to take the totality fact to be metaphysically unexplained. This is the right interpretation of the strategy, for three reasons. First, the strategy is not distinctive if it then explains why [φφ are the fundamental facts] in more fundamental terms. That further explanation would be the distinctive move. Second, we are trying to keep the fundamental facts logically simple, so it won’t do to explain why [φφ are the fundamental facts] by appeal to quantificational facts. I don’t see an attractive non-quantificational option. Third, it seems exactly right that metaphysical explanation comes to an end with fundamental reality being the way that it is. We should explore this view. The problem is that if the totality fact is metaphysically unexplained, it must itself be a fundamental fact, it seems. This kind

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10 Florio & Linnebo (2021: 15–19); compare Oliver & Smiley (2016: 106–8).
of view has been defended—David Armstrong’s proposal is in the vicinity\(^{11}\)—but it is unsatisfactory. The totality fact seems non-fundamental, for two reasons.\(^{12}\)

First, the totality fact concerns which facts are fundamental. But intuitively, no fundamental fact concerns fundamentality; they only concern physical properties and relations. Throw in fundamental mental facts if you insist; fundamentality still seems the wrong sort of thing for the fundamental facts to concern.

Second, the totality fact is partially negative: it concerns the absence of any further fundamental facts. So if the totality fact is fundamental, then a partially negative fact is fundamental; but that is what we are trying to avoid.\(^{13}\)

We can pump these intuitions together by considering whether God had to put in place a fundamental fact that \[\varphi\varphi\text{ are the fundamental facts}\]. Having put in place the logically simple and positive fundamental facts, God did not have to perform one more act of creation, namely making those facts—plus the very fact she thereby creates—the fundamental facts. Intuitively, no such further fundamental fact is required.

So, it seems, that \[\varphi\varphi\text{ are the fundamental facts}\] is not itself a fundamental fact. Yet it is an ultimate metaphysical explainer, on the strategy I want to defend. That \[\varphi\varphi\text{ are the fundamental facts}\] explains the truth of negations and universal generalizations, and is not itself metaphysically explained by a deeper truth. This may seem contradictory—how can an ultimate metaphysical explainer fail to be a fundamental fact?

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\(^{12}\) An objection I do not endorse: the totality fact is quantificational, and we are trying to avoid fundamental quantificational facts. Allegedly, ‘\(\varphi\varphi\text{ are the fundamental facts}\)’ just means: any fact is fundamental iff it is among \(\varphi\varphi\). This worry does not stick. As we’ll see later (§§5–6), the totality fact should be understood non-quantificationally.

We can hold that the totality fact is an ultimate metaphysical explainer but not—in some sense—a fundamental fact, but only if we adopt some controversial meta-metaphysical positions.¹⁴ Let me sketch the strategy. According to ‘fitting’ frameworks, a metaphysical theory for \( p \) explains, ultimately in terms of how things are fundamentally, why a representation that \( p \) is apt or not, how well it ‘fits’ reality. ‘Fitting’ meta-metaphysical frameworks refine the intuitive notion of ‘a fundamental fact’ into two theoretical notions. One is the notion of an ultimate metaphysical explainer. The other is the notion of ‘the facts-in-reality’; these are the facts God had to put in place to create the universe (modulo the earlier qualifications about laws of nature and the initial conditions). ‘Fitting’ meta-metaphysical frameworks allows us to say: that \([\phi\phi \text{ are the facts-in-reality}]\) is an ultimate metaphysical explainer, but is not itself among the facts-in-reality. This proposal respects all the relevant intuitions, I will argue.

I’ll start by distinguishing the ‘fitting’ conception of metaphysical explanation from the popular ‘grounding’ conception (§2). These meta-metaphysical frameworks conceive of fundamentality differently. §3 assumes the fitting framework and makes the proposal: that \([\phi\phi \text{ are the facts-in-reality}]\) is an ultimate metaphysical explainer, but is not itself among the facts-in-reality. §4 shows that the proposal is compatible with the slogan that “\(\text{how things are fundamentally} \) metaphysically explains everything else”. The proposal is not happily formulated using the singular notion of a fact-in-reality (§5). Rather, it should use a plural predicate, sensibly glossed in English as ‘… are the facts-in-reality’ (§6). §7 checks that the ‘fitting’ framework is needed to formulate my proposal, by considering the closest proposal formulated in the grounding framework. The results are unsatisfactory. If you want to keep the fundamental facts logically simple in the way I propose, you must reject the grounding framework in favour of a fitting framework.

¹⁴ Heil’s (2006) diagnosis has something in common with mine. He alleges that talk of ‘fundamental facts’ conflates two notions: the fundamental elements of reality, which are worldly, and a complete description of fundamental reality, which is representational. Simply distinguishing reality from representation solves our puzzle, he claims: the complete description is the ultimate metaphysical explainer, and is not a fundamental element. I will argue this is not enough: substantive meta-metaphysical commitments are needed.
2. **Grounding and fitting metaphysical frameworks.**

This section sketches the grounding and fitting metaphysical frameworks. These frameworks refine differently the proto-theoretical notions of metaphysical explanation and fundamental fact. The difference is crucial to whether the fundamental facts can all be logically simple.

According to the ‘grounding’ framework, a metaphysical theory for \( p \) says what grounds \( p \); it says in virtue of what that fact holds. For example:

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(1) \text{London buses are red in virtue of the fact that London buses are of shade } R. \]

Philosophers understand grounding in different ways; I focus on the following fairly neutral understanding.\(^{15}\) Grounding gives reality its structure. To be a fundamental fact is to be ungrounded, i.e. a terminal node in the structure.\(^{16}\) Metaphysical explanation is tied to grounding: to metaphysically explain \( p \) is to say what grounds \( p \).\(^{17}\) According to grounders, the puzzle from §1 concerns what grounds the fact that [every quark is within 100m of another], etc.

According to ‘fitting’ frameworks, a metaphysical theory for \( p \) explains, ultimately in terms of how things are fundamentally, why a representation that \( p \) is apt or not, how well it ‘fits’ reality (hence the name).\(^{18}\) Frameworks of this kind will differ on what representational entities they concern, and how they conceive of the relevant aptness of a

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\(^{15}\) We can be neutral on whether grounding is best represented using a sentence operator or a predicate.


\(^{17}\) Some say that \( Q, R, S \) and \( T \) metaphysically explaining \( p \) just is their grounding \( p \). (Fine 2001: 15; Dasgupta 2014: 558, 2017: 75). Others say that the explanatory relationship is ‘backed by’ the grounding relationship (Audi 2012: 687–8).

\(^{18}\) I’m leaving it open for now whether fitters’ ultimate metaphysical explainers should be \( \varphi \varphi \), or that \( \varphi \varphi \) are the facts-in-reality. I will argue for the latter view.
representation. Our working example of a fitting framework will be the ‘truth-explaining’ approach.

In the ‘truth-explaining’ framework, a metaphysical theory for \( p \) explains, ultimately in terms of how things are fundamentally, why the proposition that \( p \) is true/false. This particular fitting framework takes propositions to be the relevant representational entities, and takes truth to be the relevant kind of aptness for propositions. Let’s use angled brackets to denote propositions. A truth-explainer’s metaphysical theory for *London buses are red* might say:

\[
(2) \text{ The proposition } \langle \text{London buses are red} \rangle \text{ is true because: London buses are of shade } R. 
\]

It is not a fundamental fact that London buses are of shade \( R \); but as long as we can explain the truth of *that* proposition in more fundamental terms, and so on till we hit the fundamental facts, then we have explained the truth of \( \langle \text{London buses are red} \rangle \) ‘ultimately’ in terms of the fundamental facts. We should not require metaphysical explanations to appeal directly to the fundamental facts, because such explanations typically don’t deliver understanding. For example, an account of why \( \langle \text{London buses are red} \rangle \) is true, in terms of what certain quarks are up to, leaves us baffled. We should permit illuminating metaphysical explanations, like (2), that merely take us closer to the fundamental facts.

I favour another fitting framework (Author Article1, Article2). Unlike truth-explaining, it is designed so that metatheoretical theories can characterize vagueness and relativity. My approach assesses judgements and states of suspending judgement. Aptness comes in degrees, and what it is apt to judge can vary between people. Aptness is not truth, on this approach. I yearn to tell you more, but will restrain myself. Truth-explaining will be our working example of a fitting framework. It is inferior to my alternative, but for reasons that make no difference to what follows, and it has the virtue of being familiar. According to truth-explainers, the puzzle from §1 concerns why the proposition that [every quark is within 100m of another] is true. That’s what needs explaining in fundamental terms.

Grounders and fitters differ in how they conceive of the fundamental facts; they refine that proto-theoretical notion differently. They differ over whether only the fundamental facts are metaphysically ‘real’, or whether the non-fundamental facts are just as ‘real’. Let me explain.

Fitters hold that only the fundamental facts are metaphysically ‘real’—we can call them the ‘facts-in-reality’.19 That is, metaphysical reality contains only the fundamental facts, and representations answer to them.20 A representation of some non-fundamental matter does not answer to a corresponding non-fundamental fact. For example, the proposition that [London buses are red] does not answer to the fact that they are red, according to (2). That can only be because facts about what’s red are not metaphysically ‘real’; they are not facts-in-reality. Until we get down to fundamental matters, truth-explaining metaphysical theories explain away the metaphysical reality of the relevant facts.

By contrast, grounders hold the grounded facts to be just as real as the ungrounded facts. Grounding structures reality, so reality contains fundamental and non-fundamental facts, on this picture. Grounders can put grounded and ungrounded facts on

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19 The terminology is Fine’s (2001).

20 Explaining how representations answer to the fundamental facts can be a matter of chaining together explanations that do not appeal to the fundamental facts until the last step, I suggested above.
a metaphysical par by asserting that they are all facts-in-reality, or by rejecting that notion.\footnote{Grounders who hold that the non-fundamental is just as real as the fundamental include: Schaffer (2009: 360), Rosen (2010: 114), Audi (2012a: 101–102) and Bennett (2017: 4, 135, 216).}

Unfortunately, while most metaphysicians who use the word ‘grounding’ hold the picture just described, some do not. Notably, Fine (2001, 2012) holds that ‘grounded’ facts are typically \textit{not} facts-in-reality.\footnote{I am not sure that Fine’s picture is coherent, unless it is a fitting framework in disguise; but let’s not get into that.} What others explain, Fine explains \textit{away}. I find it unhelpful to assimilate such different conceptions under the banner of ‘grounding’. The metaphysical pictures are too different. I will reserve the label ‘grounding framework’ for views on which the grounded is just as real as the ungrounded.\footnote{DeRosset (2017) agrees that if \( p \) is grounded, then \( p \) is a fact-in-reality: he says that grounding \( p \) precludes ‘conciliatory irrealism’ about \( p \). But, he argues, one can use the notion of grounds to give a metaphysical theory for \( p \) that does not ground \( p \) itself, and so does not entail that \( p \) is a fact-in-reality. The idea is to ground the existence of sets of fundamental facts, and sets of such sets, etc., and have these sets stand in for non-fundamental facts. I reserve the label ‘grounding framework’ for views that ground the non-fundamental facts, unlike DeRosset’s suggestion.}

3. \textbf{The ultimate metaphysical explainer is not among the facts-in-reality.}

Let’s see how fitters can keep the fundamental facts—conceived of as the facts-in-reality—logically simple and positive. We will assume a truth-explaining framework. ‘\( \varphi \varphi \)’ is our label for the facts-in-reality.

Truth-explainers should admit that there is a thin sense of ‘because’ in which <\( p \)\> is always true ‘because’ \( p \). That is not the sense of ‘because’ they use to frame their theories. In their metaphysically meaty sense of ‘because’, it is only in special cases that <\( p \)\> is true because \( p \). For instance, <London buses are red> is true because \( p \).
they are of shade R, not because they are red. Let’s consider what happens in the special cases where metaphysical explanation hits bedrock. Define:

\[ p \text{ is an ultimate metaphysical explainer } \overset{\text{def}}{=} <p> \text{ is true because: } p. \]

Ultimate metaphysical explainers lie at the bottom of every chain of metaphysical explanation, according to fitters. To illustrate, suppose that \(<\text{London buses are red}>\) is true because: they are of shade R. But \(<\text{London buses are of shade R}>\) is true because of facts about how the human visual system reacts to those buses. And so on, till we hit bedrock—ultimate metaphysical explainers.

The notion of an ultimate metaphysical explainer is one way to refine the intuitive notion of a ‘fundamental fact’. It is defined in terms a primitive theoretical notion of the fitting framework, namely the metaphysical explanation for the truth of a proposition. I suggest fitters take some facts being ‘the facts-in-reality’ to be another primitive theoretical notion. The facts-in-reality are thus a second refinement of ‘the fundamental facts’. With these two refinements of the notion of ‘the fundamental facts’, fitters have the degree of freedom needed to make the following proposal.

**(PROPOSAL)** That \([\varphi \varphi \text{ are the facts-in-reality}]\) is an ultimate metaphysical explainer, but is not itself among the facts-in-reality; it is not one of \(\varphi \varphi\).

The facts-in-reality correspond to the intuitions about what God had to do to create the world (modulo the qualifications made in §1 about laws of nature and the initial conditions). The facts-in-reality are logically simple and positive facts concerning fundamental physical objects, quantities, and relations (say). They do not concern which facts are the facts-in-reality. Still, that \([\varphi \varphi \text{ are the facts-in-reality}]\) is explanatory bedrock; it cannot be metaphysically explained in more fundamental terms. Precisely: \(<\varphi \varphi \text{ are the facts-in-reality}>\) is an ultimate metaphysical explainer, but is not itself among the facts-in-reality; it is not one of \(\varphi \varphi\).

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24 My fitting framework (Article1, Article2) further separates thin explanations of truth from metaphysical explanations of the aptness of representations. It does not identify aptness with truth, so the explananda differ.
facts-in-reality is true because \( \varphi \varphi \) are the facts-in-reality. It is an ultimate metaphysical explainer.

I suggest taking ‘the facts-in-reality’ to be a primitive notion of our metaphysical theory. There is precedent for taking a notion in the vicinity of fundamentality to be a theoretical primitive. Kit Fine (2001) takes the notion of a fact-in-reality as a theoretical primitive. Ted Sider takes as primitive a sub-propositional element’s being ‘structural’ (2011: 8–10). My suggestion is of a sort that’s de rigeur. More importantly, there is nothing wrong with it. Metaphysical theories can introduce primitive theoretical notions because they are theories. One cannot demand that a theory only use notions that one grasped antecedently. For example, a theory of the behaviour of matter can introduce the theoretical notions of being a proton, and of being positively charged. Theoretical notions are explained by explaining the theories in which they appear. In the case at hand, the notion of the facts-in-reality glosses intuitions about what God had to do to create the world; and the PROPOSAL relates the facts-in-reality to metaphysical explanation, which itself glosses certain intuitions. We understand the theory by understanding how it captures the relevant intuitions and how its claims relate to each other. We understand the theory’s primitive notions by understanding the theory. A philosopher may announce that they do not understand the theory, but that should not deflect those of us who do understand it.

Let’s check that \( \varphi \varphi \) being the facts-in-reality] explains the truth of the troublesome universal generalizations from §1, and then consider the troublesome negations. In my view, \( < \text{every quark is within 100m of another}> \) is true because: \( \varphi \varphi \) are the facts-in-reality. That explanation is plausible because quarks can only exist fundamentally. More precisely: for there to be true propositions about a particular quark, that quark must feature in the facts-in-reality. Quarks differ from non-fundamental objects, like tables, in this regard. Propositions about a particular table can be true even though that table does not feature in the facts-in-reality. Quarks are not like that. If the facts-in-reality feature \( n \) quarks, the situation is not well described by \( < \text{there are } n+1 \text{ quarks}> \). (This is a truth about the right ‘fitting’ metaphysical theory for propositions about quarks.) So \( < \text{the quarks that feature in } \varphi \varphi \text{ are all the quarks}> \) is true, because \( \varphi \varphi \) are the facts-in-reality. That \( \varphi \varphi \) are the facts-in-reality] also settles that the truth of
<every quark that features in $\varphi \varphi$ is within 100m of another quark>. Hence that $[\varphi \varphi$ are the facts-in-reality] settles the truth of <every quark is within 100m of another>.

The same move allows us to explain the truth of the troublesome negations. For spacetime point $a$ and alien field value property $F_v$, why is $\neg F_v a$ true? I resist the answer that $\neg F_v a$ is among the facts-in-reality. Rather, $\neg F_v a$ is true because: $\varphi \varphi$ are the facts-in-reality—that completely characterizes how things are fundamentally. $F_v a$ is not among $\varphi \varphi$ (else $F_v a$ would be true). That’s a world it is apt to describe as: $\neg F_v a$.

This explanation is plausible because $F_v a$ can only obtain fundamentally. More precisely: for $F_v a$ to be true, that $[F_v a]$ must be among the facts-in-reality. That’s a truth about the right ‘fitting’ metaphysical theory for $F_v a$. Hence that $[\varphi \varphi$ are the facts-in-reality] settles that $F_v a$ is false, and $\neg F_v a$ is true.

There is no puzzle about why $\neg p$ is true, when $p$ could be true without $p$ being among the facts-in-reality. For then, the truth of $\neg p$ can be explained in the same kind of way as the truth of $p$ would be. For example, the arrangement of quarks in a region explains why it is true that $\neg \text{it is not the case that: the region contains a table}$.

Fitting frameworks refine the notion of fundamentality into two: the facts-in-reality, and the ultimate metaphysical explainers. The intuition that the ‘fundamental’ facts are particular, logically simple and positive must be disambiguated. It is a correct claim about the facts-in-reality: they are particular, logically simple and positive. They are what God had to put in place to create the universe (modulo the qualifications from §1).

What about the ultimate metaphysical explainer I posit? That $[\varphi \varphi$ are the facts-in-reality] is partially negative: it builds in the claim that there is no more to fundamental reality. That is unobjectionable. Is that ultimate metaphysical explainer logically simple, or is it quantificational? The answer depends on how we analyze ‘$\varphi \varphi$ are the facts-in-reality’. I will investigate two views of its logical form (§§4–5). On the preferable ‘collective’ analysis, that $[\varphi \varphi$ are the facts-in-reality] is logically simple.

4. The singular notion of a fact-in-reality.

Is the ultimate metaphysical explainer logically simple? Let’s consider two analyses of “$\varphi \varphi$ are the facts-in-reality”, starting with the ‘singular’ view, which I don’t like. This view
analyses “φφ are the facts-in-reality” using the singular notion of a fact-in-reality. Consider the following singular analysis:

\[ \text{[φφ are the facts-in-reality]} \overset{\text{def}}{=} \forall p(p \text{ is a fact-in-reality} \iff p \text{ is among φφ}) \]

On this singular version of my proposal, the alleged ultimate metaphysical explainer is: \( \forall p(p \text{ is a fact-in-reality} \iff p \text{ is among φφ}) \). Is that plausibly an ultimate metaphysical explainer? Obviously, it is quantificational (quantifying over facts or propositions). But so what?25 We’ve secured that the facts-in-reality are logically simple; is that enough? I think not. Surely metaphysical explanation does not come to an end with the facts-in-reality meeting some complex condition, such as \( \forall p(p \text{ is a fact-in-reality} \iff p \text{ is among φφ}) \). The facts-in-reality meet that complicated condition because they are what they are.

Metaphysical explanation should come to an end with the specific nature of fundamental reality. The singular version of my proposal cannot do justice to this.

Let me press the point. Surely the following slogan is in the vicinity of an important truth.26

\[(\text{THE COMPLETENESS SLOGAN}) \text{ How things are fundamentally ultimately } \]
\[ \text{metaphysically explains everything else.} \]

This rules out views of fundamental reality that are too stingy to account for non-fundamental matters. (We may need to allow exceptions for truths that make no demands

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25 The following objection can be answered. \( [\forall p(p \text{ is a fact-in-reality} \iff p \text{ is among φφ})] \) is made true partly by: \([\text{New York is a city} \text{ is not a fact-in-reality, and is not among φφ}] \). An ultimate metaphysical explainer should not quantify over non-fundamental facts like \text{New York is a city}. Solution: re-state the proposal using binary quantifiers (Westerståhl 2016). \([\text{Every fact-in-reality is among φφ}] \) is not a claim about everything, but only about the facts-in-reality. It is not even partly made true by anything about the fact that \text{New York is a city}. Similarly for \([\text{each of φφ is a fact-in-reality}] \).

26 The slogan is in the spirit of Sider’s ‘completeness’ principle (2011: 105–6, 115–6; 2020: 40).
of the world, and thus do not need explaining in terms of how the world is fundamentally; let’s not get into that.)

Initially it seems that the singular proposal respects THE COMPLETENESS SLOGAN. \[ \forall p (p \text{ is a fact-in-reality iff } p \text{ is among } \varphi \varphi) \] concerns what facts-in-reality there are, and thus “how things are fundamentally”, and so might seem to be a candidate to metaphysically explain everything else. But that’s too weak an interpretation of THE COMPLETENESS SLOGAN.

To see this, consider a rival view, according to which \((*)\) is an ultimate metaphysical explainer.\(^{27}\)

\(<\text{Every quark is within } 100\text{m of another}>\) is true because:

\((*)\ \forall x (\text{if it is a fact-in-reality that } x \text{ is a quark, then } \exists D \exists y (D \text{ is a distance relation of less than } 100\text{m}) \& (\text{it is a fact-in-reality that } y \text{ is a quark}) \& (\text{it is a fact-in-reality that } Dxy)).\)

None of the quantifiers in \((*)\) appears within the scope of a ‘fact-in-reality’ operator. Thus the proposal apparently accounts for the truth of <every quark is within 100m of another> by appeal only to non-quantificational facts-in-reality. But it sacrifices the idea that metaphysical explanation should bottom out in the specific nature of how things are fundamentally. Metaphysical explanation comes to an end, on this proposal, not with the specific nature of fundamental reality, but with a quantificational claim about the facts-in-reality. That seems wrong. Metaphysical explanation does not come to an end with the facts-in-reality meeting some complex condition like \((*)\). The facts-in-reality meet that complicated condition because they are what they are, i.e. because \(\varphi \varphi\) are the facts-in-reality. That’s part of the intuition behind THE COMPLETENESS SLOGAN.

Return to the singular version of my proposal, which analyses \([\varphi \varphi \text{ are the facts-in-reality}]\) as: \(\forall p (p \text{ is a fact-in-reality } \leftrightarrow p \text{ is among } \varphi \varphi).\) I don’t see what criterion would deem that \([\forall p (p \text{ is a fact-in-reality } \leftrightarrow p \text{ is among } \varphi \varphi)]\) is an acceptable ultimate metaphysical explainer, but \((*)\) is not. Both proposals posit logically complex ultimate

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\(^{27}\) The proposal is inspired by Williams (2012 §3.2).
metaphysical explainers. Reflecting on (*) suggests that metaphysical explanation comes to an end with the specific nature of fundamental reality, not with the facts-in-reality meeting a complex condition. The singular proposal fails this requirement. Luckily, we can do better.

5. The collective notion of the facts-in-reality.

Now let’s consider the ‘collective’ analysis of “φφ are the facts-in-reality”—this is the view I endorse. This approach takes as primary a plural predicate, of some facts being the facts-in-reality, not the singular notion of one fact being a fact-in-reality. The primary notion is a predicate that applies to exactly one plurality of facts. Here are some other examples of plural predicates that apply uniquely. Russell and Whitehead authored *Principia Mathematica*. It is not the case that Russell authored *PM*, and it is not the case that Whitehead authored *PM*. (At least, the expression “authored *PM*” can be interpreted that way.) Russell and Whitehead are the authors of *PM*. Ninety-eight stones form Avebury Stone Circle. No stone itself forms the circle. Maybe the atoms in the stones also form *Avebury Stone Circle*, but they are not stones that form *Avebury Stone Circle*. Those ninety-eight stones are the stones that form Avebury Stone Circle. The two logicians jointly authored *PM*; ninety-eight things jointly are stones that form Avebury Stone Circle. Analogously, certain facts jointly are “the facts-in-reality”.

On the collective analysis, the primary notion of fundamentality is a plural predicate. “φφ are the facts-in-reality” analysed as \( \exists! \phi \), where “\( \exists! \)” is a higher-order plural predicate that applies only to φφ. The proposed ultimate metaphysical explainer is that

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28 Oliver & Smiley (2016: 3, 131–3).
29 This is a “plurally unique” definite description: see footnote 31.
30 This example simplifies a complex archeological situation.
31 I have been glossing “\( \exists! \phi \)” as “φφ are the facts-in-reality”. That definite description is ambiguous between the singular and collective views. On the singular view, “the facts-in-reality” is a “plurally exhaustive definite description”: it denotes all the facts that individually satisfy the singular predicate (Oliver & Smiley 2016: 131–3). On the collective view, “the facts-in-reality” is a “plurally unique definite description”: it denotes some facts when only they jointly satisfy R (ibid.).
\( \mathcal{R} \varphi \phi \), not that: \( \forall \varphi (\mathcal{R} \varphi \phi \leftrightarrow \varphi \varphi = \varphi \phi) \). (That view falls foul of my objection to the singular proposal: it makes the ultimate metaphysical explainer a complex condition.)

\( \mathcal{R} \varphi \phi \) is not a quantificational fact. Still, it is not accidental that \( \mathcal{R} \) applies to at most one plurality of facts. It is in the nature of the property. Similarly, it is not accidental that at most one plurality are *stones that form Avebury Stone Circle*; it is in the nature of the property. That ss are stones that form Avebury Stone Circle settles that no other things do so, without help from further facts. That Russell and Whitehead authored *PM* settles that no other people did. Similarly, \( \mathcal{R} \varphi \phi \) settles that no other facts jointly satisfy \( \mathcal{R} \). That is, \( <\forall \varphi (\mathcal{R} \varphi \phi \leftrightarrow \varphi \varphi = \varphi \phi)> \) is true because: \( \mathcal{R} \varphi \phi \).

The collective proposal leaps the hurdle which felled the singular view (§4). On the collective proposal, the ultimate metaphysical explainer is logically simple: \( \varphi \varphi \) satisfy a plural predicate. Metaphysical explanation does not come to an end with a complex condition on the facts-in-reality, but with the facts-in-reality being what they are, that is, with the specific nature of fundamental reality. Thus the collective version of my proposal does full justice to THE COMPLETENESS SLOGAN, while the singular version does not.

6. **In what sense is the fundamental complete?**

That \([\varphi \varphi \text{ are the facts-in-reality}]\) is not itself one of the facts-in-reality; it is not among \( \varphi \varphi \). So in my view, the ultimate metaphysical explainer is not itself one of the facts-in-reality. One might object that this is incompatible with THE COMPLETENESS SLOGAN.

\((\text{THE COMPLETENESS SLOGAN})\) *How things are fundamentally* ultimately metaphysically explains everything else.

Allegedly, fitting frameworks must interpret THE COMPLETENESS SLOGAN as follows.

\((\text{THE COMPLETENESS OF THE FACTS-IN-REALITY})\) Facts-in-reality—\( \varphi \varphi \) and sub-pluralities of them—ultimately metaphysically explain everything else.

If that’s right, then my proposal is mistaken. If \([\varphi \varphi \text{ are the facts-in-reality}]\) is an ultimate metaphysical explainer, then it would itself be among the facts-in-reality.
I reply: fitting frameworks should not interpret THE COMPLETENESS SLOGAN that way. THE COMPLETENESS OF THE FACTS-IN-REALITY is mistaken: \( \varphi \varphi \) don’t explain the correctness of a universal generalization. THE COMPLETENESS SLOGAN should instead be read as follows.

\( \text{(THE COMPLETENESS OF THEIR BEING THE FACTS-IN-REALITY)} \) That \( \varphi \varphi \) are the facts-in-reality] ultimately metaphysically explains everything else.

That \( \varphi \varphi \) are the facts-in-reality] characterizes ‘how things are fundamentally’, and that’s what ultimately metaphysically explains everything else, according to this principle. Hence it respects THE COMPLETENESS SLOGAN. The picture remains that our metaphysical explanations ultimately appeal to how reality fundamentally is. This way of interpreting THE COMPLETENESS SLOGAN allows the facts-in-reality to be logically simple and positive.

Unfortunately, ‘fitting’ is often conceived in a way that implies THE COMPLETENESS OF THE FACTS-IN-REALITY [the bad view]. It is natural to think that only something worldly can make representations true: the world must generate the truths. The facts-in-reality themselves must make propositions true, or so it seems. Call this the ‘truth-generator’ conception of how representations fit fundamental reality. Armstrong’s truth-maker view is in this vicinity: he holds that ontologically basic, worldly states of affairs make representations true (Armstrong 1997: 115, 2004: 5–7).

The truth-generator conception is unattractive. On that view, facts-in-reality ‘generate’ the truth of propositions. Why would that be the only thing they generate? Why would \( \varphi \varphi \) generate the fact that \( [<\text{there are tables}> \text{is true}] \), but not the fact that \( [\text{there are tables}] \)? No principled position treats those cases differently. The generation of truths is only plausible in a more general fact-generator framework—that is, in a grounding framework.\(^{32}\) A grounding framework is not a fitting framework: it explains why there are tables, and so must say that \( [<\text{there are tables}> \text{is true because of that fact. So fitters must deny that metaphysical explanations say how worldly facts generate facts.}}\)

\(^{32}\) Trogdon (2020) opinionatedly reviews work on how truth-making relates to grounding.
about which propositions are true. That is, fitters must reject the truth-generator conception.

Instead, I suggest we take an ‘explanation-centred’ conception of fitting. An explanation-centred conception takes as primary formulations like: ‘<p> is true because [ϕ are the facts-in-reality]’. It merely re-phrases this explanation to say: ‘That [ϕ are the facts-in-reality] makes <p> true’. (Analogously, Dasgupta (2017: 75) holds that ‘g grounds p’ merely rephrases ‘p because g’.) An explanation-centred conception of fitting suggests that [ϕ are the facts-in-reality] is an appropriate ultimate metaphysical explainer. For our metaphysical explanations should ultimately appeal to our theory of how things are fundamentally. Our metaphysical theory of how things are fundamentally does not simply say that ϕ; it says that [ϕ are the facts-in-reality]. So that’s what our ultimate metaphysical explainer should be.

7. The proposal takes a holistic view of fundamental reality.

In my view, that [ϕ are the facts-in-reality] is the only ultimate metaphysical explainer. It lies at the bottom of every chain of metaphysical explanation. We arrived at this conclusion from two directions. First, it is the natural way to interpret THE COMPLETENESS SLOGAN, given the strategy for keeping the facts-in-reality logically simple (§6). Second, it is a natural consequence of the collective conception of the facts-in-reality (§5). On that conception, what’s primary is the nature of fundamental reality as a whole, not individual facts-in-reality. So that’s where metaphysical explanation should come to an end. And end it does: <ϕ are the facts-in-reality> is true because: ϕ are the facts-in-reality. On this view, that’s the only case in which <p> is true because: p.

One might object to how I explain the truth of <ψ>, when ψ is one of ϕ. In my view, <ψ> is true because: ϕ are the facts-in-reality. Informally: <ψ> is true because it corresponds to part of how reality fundamentally is. One might object that the other facts-in-reality are irrelevant to explaining why <ψ> is true, and so the explanation should not invoke all the facts-in-reality. The collective conception may seem excessively holistic in this respect.

I reply in two stages. First, I accept that <ψ> is true because: ψ is one of the facts-in-reality. In most contexts, we do not need to explain the truth of propositions directly in
terms of the ultimate metaphysical explainer, we just need an explainer that’s suitably ‘closer’ to the ultimate metaphysical explainer (§2). So we can explain why <ψ> is true without appealing to what the other facts-in-reality are. However, we can also explain why <ψ> is true on the grounds that [φφ are the facts-in-reality]. That explanation shows directly how <ψ> fits fundamental reality. This account strikes me mildly surprising, not absurd.

Second, a host of arguments favour a holistic view of fundamental reality. For example, quantum entanglement may support holism (Schaffer 2010b: 50–55). For another, ‘structuralism’ about the points of spacetime is attractive: in some sense, the identity of a point consists in its spatiotemporal relations to the other points. A structuralist view of the points of spacetime must be holistic: the points must “come together in one go”. I formulate structuralism, and argue we should be structuralists about all fundamental individuals, in (Author MS). And of course, there’s the argument of this paper. We cannot adjudicate the ultimate plausibility of holism by noting one mildly surprising consequence.

The rest of this section clarifies the kind of holism to which the collective conception of the facts-in-reality commits us. Given the collective notion of the facts-in-reality, they come together, all in one go. God created them in one act of creation. Another gloss: φφ are fundamental reality. I don’t mean that first all the facts obtain, and then some of them are, as a group, upgraded to being the facts-in-reality. I mean that these particular facts obtain—in a metaphysically heavyweight way—as a group.

Let’s compare this conception of the facts-in-reality with another holistic view, which says that there can only be one fact-in-reality. Presumably it shouldn’t be a puzzling brute fact that however things could have been, there would only have been one fact-in-reality. Rather, it should be part of the nature of fundamentality. Fundamentality, on this view, is refined into the concept of the fact-in-reality. Call this uniqueness-implying conception ‘monism’ about being a fact-in-reality. (The view is inspired by Jonathan
Schaffer’s ‘priority monism’, especially Schaffer 2010a: 321.\textsuperscript{33} On this approach, <there are exactly n quarks> is true because: \(\psi\) is the fact-in-reality (for the appropriate fact \(\psi\)). What rules out further quarks is that \(\psi\) is the fact-in-reality, not \(\psi\) itself.

Monism implies that fundamental reality “comes all in one go”, as does my collective conception. But the collective conception allows us to stick with an attractive view of what the facts-in-reality might be like: quarks and spacetime-points having properties and bearing relations, nothing logically complex. Monism has to cram all that into one fact. There are several ways to do so. One way takes the conjunction of all the logically simple facts about quarks, spacetime-points and so forth. Another says that the fact-in-reality is that \([c \text{ is } F]\), where \(c\) is the cosmos (the whole of spacetime), and \(F\) denotes the exact way \(c\) is. Another says that one fundamental relation holds over all the quarks, spacetime points, and so forth. Another says that the fact-in-reality is the obtaining of a certain purely qualitative state of affairs (Dasgupta 2009). Views that posit the fact-in-reality are more revisionary than those employing the collective notion of the facts-in-reality. The collective notion allows a standard view about what the facts-in-reality are, while taking a holistic view of their being the facts-in-reality.

8. Grounders cannot adapt my proposal.

Grounders cannot adopt my way of keeping the fundamental facts logically simple. Fitting frameworks have two primitive notions, and so two refinements of the notion of the fundamental facts. This allows fitters to formulate my proposal:

\[
\text{That } [\phi \& \psi \text{ are the facts-in-reality}] \text{ is an ultimate metaphysical explainer, but is not itself among the facts-in-reality.}
\]

\textsuperscript{33} Schaffer’s ‘priority monism’ (2010a, 2010b) says that the cosmos—spacetime itself—is the fundamental entity. In Schaffer’s (2009) framework, the central claims of metaphysics concern which entities ground other entities. Sider (2011: 161–5) criticizes this object-oriented framework.
Grounders only have one primitive notion, namely grounding. They only have one refinement of the notion of the fundamental facts, namely as the ungrounded facts. If something is an ultimate metaphysical explainer, then it is ungrounded, and fundamental in the only sense the framework recognizes. So the closest grounders can come to my proposal is:

That \([\varphi \varphi \text{ are the ungrounded facts}]\) is itself fundamental, i.e. ungrounded.

This is Armstrong’s ontologically basic ‘totality fact’ (1997: chapter 13; 2004: chapters 5–6), translated into the idiom of grounds. There are two problems with this proposal.

First, we are trying to avoid fundamental quantificational facts; but \([\varphi \varphi \text{ are the ungrounded facts}]\) is doubly quantificational. \(\psi\)’s being ungrounded is a matter of there not being some plurality of facts that ground it. In other words, that \(\psi\) is ungrounded just is: \(\neg \exists \varphi \varphi (\varphi \varphi \text{ ground } \psi)\). So its being fundamental that \([\varphi \varphi \text{ are the ungrounded facts}]\) just is: its being fundamental that \([\forall \psi (\neg \exists \varphi \varphi (\varphi \varphi \text{ ground } \psi) \leftrightarrow (\psi \text{ is one of } \varphi \varphi))]\). The alleged fundamental fact is quantificational (quantifying over facts and over pluralities of facts). But the point of the exercise was to avoid fundamental quantificational facts. Grounders cannot do so in this manner.

Suppose we set aside that desideratum. Is it plausibly fundamental that \([\varphi \varphi \text{ are the ungrounded facts}]\)? No. The fundamental facts are not about fundamentality. The fundamental facts concern fundamental physical objects, quantities, and relations; fundamentality is not one of those. This seems right generally—I deny that any of the facts-in-reality are about what the facts-in-reality are—but it is particularly compelling in the grounding framework. Surely it is not a fundamental matter what grounding relations

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34 Some grounders accord a special status to principles about how facts are grounded (e.g. Dasgupta 2014). Those principles may count as a second kind of a ‘fundamental fact’. That’s of no help here: that \([\varphi \varphi \text{ are the ungrounded facts}]\) is not a principle about how facts are grounded.
hold, let alone what grounding relations don’t hold.\footnote{This argument pumps intuitions in the vicinity of Sider’s ‘purity’ principle: “fundamental truths involve only fundamental notions” (2011: 106). Remarkably, Sider holds that fundamentality is a fundamental notion (2011: 137–141).} So it is not fundamental that \{\varphi \varphi\} are the ungrounded facts.

I conclude that grounders cannot say that [every quark is within 100m of another] in virtue of [\varphi \varphi\} being the ungrounded facts], holding that the latter is fundamental. That proposal does not avoid fundamental quantification facts, and is inherently implausible. I doubt that grounders can avoid fundamental quantificational facts by any other means.\footnote{Amijee (2021) reviews and criticizes recent attempts to keep quantification out of the ungrounded facts.} If that’s right, then to keep the fundamental facts logically simple, we should reject the grounding framework in favour of a fitting framework.

9. Conclusion.

One might have thought that nothing hangs on the choice between the grounding and fitting frameworks, and that there is no good reason to favour one over the other. That is not so. Which metaphysical views are plausible depends on one’s meta-metaphysics—one’s choice of framework for formulating metaphysical claims. Ted Sider is dead right about that (Sider 2020, esp. chapter 1; 2011 chapters 5.6 & 9–12). The right meta-metaphysical choices allow us to hold that the fundamental facts are logically simple—for a particular refined notion of the fundamental facts. Assume the grounding framework and the prospects are dim. We need a ‘fitting’ conception of metaphysical explanation, and to privilege the collective conception of the facts-in-reality.\footnote{Acknowledgements…}


