CONSTRUCTION AREA (NO HARD HAT REQUIRED)¹
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Forthcoming in Philosophical Studies

The aim of philosophy, abstractly formulated, is to understand how things in the broadest possible sense of the term hang together in the broadest possible sense of the term.

-- Wilfrid Sellars

1. Questions about Building

One theme that cuts a surprisingly large swath through philosophy is that of building up or generating or constructing or giving rise to or getting out of... and there are many other metaphors that could continue that list. A few familiar examples of this theme: how do nonmoral properties give rise to moral ones? How do nonmodal properties give rise to modal ones? How do physical properties give rise to mental ones? How do microlevel properties, objects, and states of affairs give rise to “ordinary middle-sized” ones? Or, to switch verbs, how do we get the moral out of the nonmoral, the modal out of the nonmodal, the mental out of the physical, the “macrolevel” out of the “microlevel”? How do we get an apple out of a bunch of molecules? How, quite generally, is the “big” built up from the “small”?²

You might think that’s a funny question. You might think it’s a mistake to try to say anything general about how the big is built up from the small. After all, isn’t it reasonable to suspect that the answers to the various questions will differ—that different sorts of “big,” “high-level,” or otherwise non-fundamental phenomena will be built up or grounded in different ways? Perhaps, but let’s be clear about why. There is a potentially good reason and a less good reason for thinking that there are important differences between the cases with which I began. Setting aside the less good reason will help clarify the issue at hand; exploring the better reason—and

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² Note the scare quotes. This is only a metaphor; the issue does not literally have anything to do with size!
arguing that we can indeed say something general, even in the face of it—will occupy the rest of the paper.

Here’s the less good reason. There is a clear sense in which many questions about how some particular kind of big or high-level entity arises from something else are empirical questions. Indeed, these are the ordinary questions about building. Most people who want to know how an airplane is put together are asking a question that can only be answered by mechanics and engineers—not by (most) philosophers. Most people who want to know how an aluminum atom is built out of various subatomic particles are asking a question for chemists. Most people, that is, are interested in the sort of building questions that are addressed by scientists, do-it-yourself manuals, and cookbooks. And when one thinks about building questions in that way, it looks obvious that there will be clear differences in the answers to them—that there will be clear differences in the way different sorts of things or phenomena are put together. Airplanes, apples, and aches are not put together in the same way in the sense that you can’t weld together some large pieces of sheet metal and get an apple or an ache. Tray-tables aren’t involved in aches, and neurons aren’t parts of apples.

All fair enough. But that sort of building question is not the only sort, and it is not the sort of interest to me at the moment. I am not going to discuss the largely empirical issue of which kinds of things have to be assembled in just what spatial configuration to yield, say, a functional airplane. I am instead going to discuss the very nature of *assembly itself*. I realize that sounds unbearably pretentious, but I’m going to say it again anyway: although one should indeed ask an engineer how an airplane is put together, one should ask a philosopher about the nature of *putting together*. And that is the topic of this paper.

But thus clarifying the topic still leaves room to think that there are important differences between the cases with which I began. Most of you probably think that whatever putting-together relation holds between, say, the physical and the mental is quite different from whatever putting-together relation holds between some molecules and an apple. The former, you will say, is supervenience or realization or emergence or something, while the latter is some kind of composition. And aren’t those relations different in all kinds of ways—in terms of their logical form, what sorts of entities they hold between, perhaps their modal force, and the like? Certainly they are treated independently in the literature. This line of thought is a gesture in the direction of the better reason for thinking that one cannot say anything general about how the less
fundamental is built up from the more fundamental—there are too many different flavors of putting together, assembly, construction, or, as I’ll usually say, building.

The point of this paper is to explore and evaluate that idea. Is there really too much diversity among the various building relations to say anything general? What is the relation among the various building relations? Is there more than one fundamental notion, or do some reduce to others? Can anything be said about what unites them? Or is it in the end a mistake to treat them as worthy of an overarching label like ‘building relations’ at all?

Here is the plan. I will begin by introducing some of the central kinds of building relation. Then I will characterize the main two ways in which I take them to differ from each other. I will then spend the rest of the paper addressing the questions posed in the last paragraph. I will articulate the features that all building relations share, and argue that it is an open possibility that there is only one fundamental building relation that subsumes all of the versions to be canvassed in the next section.

2. Some Building Relations

Thus far, I have relied upon informal English expressions like ‘putting together,’ ‘generating,’ and ‘building’. What, more precisely, do I have in mind? In this section I will sketch some familiar relations that seem to be good prima facie candidates for counting as forms of building. This list is not intended to be exhaustive; it is just a handful of relatively central notions. Further, my sketches will be precisely that—sketches. I do not intend to offer anything close to precise analyses of any of these relations. Doing so would be both difficult and distracting, for I don’t want to get embroiled in controversies over details. My intention is merely to say enough to direct your attention to the relevant ideas, so that we can be reasonably confident that if we disagree about how to characterize one of them, we are at least talking about the same phenomenon. This section is largely expository; readers wishing to cut to the action sequences should skip ahead to section 3.

Composition is a synchronic or atemporal many-one relation between distinct objects.\(^3\) It carries with it a cognate notion of ‘part’: if the \(xxs\) compose \(y\), then each \(x\) is a part of \(y\). This parthood relation is the intended topic of classical mereology, though I will leave it open whether it is in fact accurately characterized by the axioms of any particular formal system.

\(^3\) Though see Baxter (1988a, b), van Inwagen (1994), and Sider (2007) for exploration of the rather radical claim that composition is actually identity.
Constitution is a synchronic (or atemporal?) one-one relation either between co-located objects of different kinds, or perhaps between a colocated mass and object. That is, perhaps it holds between a lump of clay and a statue, or perhaps it holds between some clay and a statue (see Baker 2000, 2002 for an account of constitution of the former sort; see Zimmerman 1997, McKay ms for discussion of the latter sort of account). There is some dispute over whether the relata are in fact distinct objects, but for present purposes I am happy to assume that they are—that is, to assume that constitution is not identity. (See Johnston 1992, Baker 1997, and Bennett 2004 for relevant discussion and further citations.) Whether constitution should be defined in mereological terms is controversial (e.g. Zimmerman 2002 and Baker 2002). However, it at least seems clear that constitution does not have a cognate notion of ‘part’; neither the lump of clay nor the clay are usually taken to be part of the statue.

Realization is…. well, it’s hard to say exactly what realization is. There is controversy raging as I write this—see, for example, Gillett 2002, 2003; Melnyk 2003, 2006; Polger 2004, 2007; Polger and Shapiro 2008; Shoemaker 2007; Witmer ms—and not everyone uses the term the same way. In fact, ‘realization’ is sometimes used as a generic label for any building relation among properties or property instances—for almost any way in which one way a thing is determines another way it (or something else) is (e.g. Poland 1994, 18-19; Polger 2004, 118-119; Witmer ms, 3-4). On that use, it is nearly as broad as my label ‘building relation’. So, with the understanding that this is somewhat stipulative, I’ll say that realization is a one-one relation between properties, property instances, or perhaps states of affairs, centrally characterized by the idea that properties can play causal roles. For \( P \) to realize \( Q \) on some occasion (i.e., for an instance of \( P \) to realize an instance of \( Q \)) is, roughly, for \( P \) to “play the \( Q \)-role”. In this sense,

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4 This explains the dispute between Gillett (2002, 2003) on the one hand, and Polger (2007) and Polger and Shapiro (2008) on the other hand. I think Polger and Shapiro are wrong to be so dismissive of the idea that Gillett is simply talking about something else, but probably right to think that the notion that is one-one and ‘flat’ is the notion tightly linked to functionalism, and worthy of the label ‘realization’.

5 Polger and Shapiro (2008) have recently taken Gillett (2003, 2004) to task for claiming that property instances, rather than properties themselves, are the relata of the realization relation. (It is worth noting that Melnyk (2003, 2006) also takes property instances to be the relata of the realization relation.) Polger and Shapiro’s argument is not convincing. They claim, as a reductio, that taking property instances to be the relata renders multiple realization impossible. However, their argument rests upon the premise that realization and multiple realization involve the same entities—that the multiply realized entity must itself be realized. I take this assumption to be much less obvious than Polger and Shapiro do. I see nothing wrong defining multiple realization as follows (assuming we have an antecedent definition of realization in hand): property \( P \) is multiply realized by properties \( Q, R, \) and \( S \) just in case some of \( P \)’s instances are realized by instances of \( Q \), some by instances of \( R \), and some by instances of \( S \). (For Gillett’s own response, see forthcoming.)
realization is a relation between first-order properties and second-order properties (i.e., functional properties).

This is a sketch of what Carl Gillett calls ‘flat’ realization (2002, 2003)—a one-one relation between properties that are instantiated by the same individual. He thinks the notion is inadequate, and offers a competing notion that he calls ‘dimensioned realization’. However, we should not get distracted by terminology. I classify Gillett’s ‘dimensioned’ account of realization as a version of what I will call microbased determination, which is the next building relation on the list. For my purposes its name doesn’t matter. All I am doing here is surveying an array of different building relations; I could just as well refer to them by letters as by the loaded names used in the literature.

So what is microbased determination? What I have in mind here is in the vicinity not only of what Gillett calls “dimensioned realization,” but also what Kim calls “micro-basing” (1997; 1998, 80-87; 2003; 2005, 57-60), what Shoemaker calls “microrealization” (2003, 2007), and the process that yields what O’Connor calls ”structural properties” (1994, 2005). It is a many-one relation between properties instantiated by different individuals, or between property instances or states of affairs involving different individuals (I continue to not be particularly careful about this). It is the relation between the properties of the parts of a whole, and the properties of the whole. For example, the mass of a table is microbased in the masses of its parts, and the wetness of a quantity of water is microbased in the properties of the hydrogen and oxygen atoms. For further discussion of the relationship between realization and microbased determination, see Shoemaker (2007), as well as Kim (1997, 1998). One key feature of microbased determination is that it supposed to be a genuine determination relation. In some

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6 I suppose it might matter for other purposes; Polger 2007 and Polger and Shapiro 2008 think it does.
7 Kim calls the resulting properties “micro-based” or “microstructural” properties.
8 Both Kim (1997, 291) and O’Connor and Wong (2005, 663) explicitly take their notions to derive from the one Armstrong uses to construct structural universals (1978, 69-71; also 1986). However, Kim and O’Connor and Wong clearly take composition to be involved, and Armstrong does not: he thinks that he needs a notion of “nonmereological composition”. If so, the relation Armstrong himself appeals to would appear elsewhere, on the list of further candidate building relations I offer in a few pages.
9 Kim is quite right to point out a difference between “levels” and “orders”, and to distinguish the way a first-order property realizes a second-order (functional) one from microbased realization (1997, 1998). However, he is probably wrong on two counts, though neither of them matter much for the purposes at hand. First, he is definitely wrong—even by his own lights (1988)—to say that the concept of supervenience requires that the supervenient properties must be instantiated by the same entity as the subvening ones, and thus entails that the microbased properties of an entity do not supervene on the properties of its parts (1997, 290-291; 1998, 85-86; 2005, 57). (See Bontly 2002 for more detailed discussion). Second, I suspect (though am not sure) that he is wrong to think that the distinction prevents the exclusion problem from generalizing (1997, 1998, 2005).
sense or other the microbased properties are not supposed to be anything “over and above” the properties in which they are based. Of course, that’s a contentious claim, and the notion of “over and aboveness” needs to be further explicated if it is to have any real content.

But for now, I merely wish to note that there is another building relation often characterized quite similarly to microbased determination except for the “nothing over and above” part. This is emergence—another label that gets used in all sorts of ways. As Kim says, ‘Emergence’ is very much a term of philosophical trade; it can pretty much mean whatever you want it to mean, the only condition being that you had better be reasonably clear about what you mean, and that your concept turns out to be something interesting and theoretically useful (2006, 548).

I will use the term to mean what is sometimes called ‘ontological emergence’ or ‘strong emergence’ (Bedau 1997, O’Connor 1994 and 2005, Chalmers 2006; see McLaughlin 1992 for extensive historical discussion)—the kind of emergence that’s not supposed to be purely epistemic, and is not supposed to be the thin harmless notion scientists sometimes use. (That harmless notion is some version of microbased determination.) Emergent properties in this sense are purported to be, in some sense or other perennially under dispute, ‘genuinely novel’ or ‘over and above’ the base. Emergent properties are not entailed by, and thus not deducible even in principle from, the base properties. As noted, it is frequently characterized in a way that amounts to the denial of microbased determination—the emergent features of a whole, if any there be, are not settled by the features of its parts taken separately or together (see especially O’Connor 1994, 2005 and van Gulick 1997). Note, however, that I have not claimed that it is either one-one or many-one. The literature does not appear to have reached a consensus on this.

If the base is taken to be a plurality of property instances or states of affairs—part \( p_1 \)’s being \( F_1 \), part \( p_2 \)’s being \( F_2 \)… part \( p_n \)’s being \( F_n \)—then the emergence relation is many-one. But if the base is taken to be a microbased property built in the above sense from that plurality, then the emergence relation comes out one-one.

That concludes my rough-and-ready partial survey of a central cluster of building relations. There are others. The list of candidates includes determination in the determinate-determinable sense, truth-making, and set membership, or at least the relation of singleton formation that Lewis took to be both indispensable and mysterious (1991, §2.1). And, notably, the notion of grounding recently given sustained attention by Kit Fine (e.g. 2001), Jonathan

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10 van Gulick calls it “radical kind emergence” (2001, 17)
Schaffer (2009), and others. 11 And the nonmereological structure-making relation that David Armstrong claims generates structural univerals, and states of affairs from particulars and universals (1986). 12 And the bundling relation that bundle theorists claim generates objects from properties or tropes. (On Paul’s view of the bundling relation (2002), it is already on the list under the label ‘mereological composition’). If the list includes supervenience at all, it only includes some instances of that relation. 13 (It should be noted, though, that most actual supervenience claims in philosophy were and are intended as building claims.)

The list is long. In the interests of time and space—not for any deeper reason—I’m not going to explore all of those relations here. My discussion will largely rely upon the five that I’ve said a bit about—composition, constitution, realization, microbased determination, and emergence. If I convince you that I am right about them, the lessons will likely apply to the others as well, but I will leave that as an exercise for the reader.

One caveat as I move into the more substantive part of the paper. I have already noted that there is a lot of room for disagreement about how to characterize these relations, and how to use the relevant terminology. But the disagreements extend beyond that. People also disagree about

• which building relations ever hold
• which building relations hold in which cases
• which building relations hold in which direction,

and perhaps even

• which relations really are building relations, according to the core notion I will articulate in section 6.

11 Why is grounding a mere entry on the list, rather than the overarching relation under discussion in this paper? Well, the first point to note is that the term ‘grounding’ is occasionally used in a quite generic sense, and on that use it is perhaps synonymous with my term ‘building’. But the second point to note is that when the label is introduced in a more specific way, it is too specific to be what I have in mind by ‘building’. Grounding is widely taken to be hyperintensional—it can hold asymmetrically between relata both of which necessitate each other. Not all building relations need be like that. It is also often (not always) taken to hold only between propositions or states of affairs. Again, not all building relations are like that.

12 In characterizing Armstrong’s idea, McDaniel (2009) even uses the same ‘building’ metaphor that I do: “structure-making is allegedly a kind of composition relation that ‘builds’ states of affairs out of particulars and universals and structural universals out of simpler universals” (251).

13 The problem is that supervenience—in, I believe, all of its extant forms—is reflexive and can hold symmetrically. Building relations must be irreflexive and asymmetric; see section 6, especially note 25. Still, though, perhaps we can say that supervenience can hold in a building way—that instances of the supervenience relation that hold asymmetrically between distinct relata do qualify as instances of building. See also Kit Fine’s discussion of generative operations vs. generative applications of operations (unpublished b).
Insofar as possible, I am going to remain neutral on these questions in order to explore the notion of building in full generality. For example, I myself do not believe that the mental is emergent from the physical, and indeed am not inclined to believe in emergence at all. But I still count it as a building relation. Similarly, those who deny that the composition relation ever obtains are not committed to denying that it would be a building relation if it did.\textsuperscript{14} For another kind of example, consider Jonathan Schaffer’s view that “the whole is prior to its parts… the cosmos is fundamental, with metaphysical explanation dangling downwards from the One” (2010a, 31). Because he thinks that everything is grounded in the One rather than the other way around, he thinks that building relations hold in a different direction than many other people do. But this has little impact on the question of whether grounding is a building relation; his opponents can agree with him about that.

3. Two Main Axes of Difference

The five building relations that I have sketched probably strike you as rather different. Certainly that thought is the implicit default position in the literature. It seems to me that the most important differences between the relations fall along two main axes. The first is what I will call the relata axis; the second is what I will call the unification axis.

The relata axis: as I have characterized them, the relations take different kinds of relata. Composition and constitution operate on objects. But realization, microbased determination, and emergence operate on properties, property instances, or states of affairs. Now, the ‘as I have characterized them’ part is important, for I have, if anything, overstated the differences. It’s really not so clear that they take such different relata. Certainly, it’s not so clear how to use the English words. I’ve already mentioned that some people use ‘realization’ in a quite general way. And I’m pretty sure that some readers have scrawled complaints in the margin like, “constitution doesn’t just hold between objects. A fact can constitute another fact, and an action another action, like when my raising my hand constitutes my asking to be called on.”\textsuperscript{15} Similarly, it might look like the composition relation can also hold between things other than objects: isn’t a

\textsuperscript{14} For the idea that composition never occurs—or at least occurs more rarely than one might have thought—see van Inwagen 1990, Merricks 2001, Rosen and Dorr 2002.

\textsuperscript{15} Compare Goldman 1969 on the level-generation of actions, though he tends to use a ‘by’ locution—I ask to be called on by raising my hand—rather than the language of constitution.
quatrain part of a poem and a battle part of a war?"\(^{16}\) And so forth. We—philosophers as well as ordinary people in ordinary contexts—use verbs like ‘compose’ and ‘part’ and ‘constitute’ and ‘emerge’ in a lot of ways that permit a lot of relata. Nonetheless, the somewhat stipulative definitions I initially gave, according to which there are differences among the relata of the various building relations, do hook onto technical notions that are live in the literature. Consequently, I will pretend that the relata axis is sturdier than it actually is. This is an acceptable pretense, because it isn’t to my advantage; one of my goals in this paper is to convince you that our building concepts are a bit of a slurry.

The unification axis: as I have characterized them, some of the relations seem to involve a certain kind of *wrapping up into one*, and others do not. That is, some unify, or gather together a multiplicity, in a way that others do not. This is a difference in logical form: some of the relations are many-one, and others are not.\(^{17}\) Composition, for example, pulls several smaller things together to make a single larger thing. Similarly for microbased determination, the process by which properties of a thing’s parts come together to determine the properties of the whole. But realization and constitution—one-one relations both—do not do this. They are determinative rather than aggregative; there is little sense of ‘bringing together’ involved. (Whether emergence counts as unifying or not depends on whether it is one-one or many-one, and is consequently a bit up for grabs.)

There may be other differences between the building relations. (One putative difference is hereby relegated to a footnote.)\(^{18}\) But these two axes capture what I take to be the primary differences, and together they are certainly enough to pose at least *prima facie* trouble for any suggestion of unity here. Nonetheless, I think that quite a lot can be said about what these

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\(^{16}\) Metaphysicians disagree about whether that is the same notion of ‘part’, and about whether there is only one composition relation. See, for example, van Inwagen 1990, 19 and Varzi 2006. See also Winston et. al. 1987.

\(^{17}\) On my usage, a relation is many-one just in case it is a two-place relation that takes a plural argument in the first argument place and a singular argument in the second argument place. (Or, I suppose, it could be a multigrade relation with at least three argument places, the last of which is somehow privileged.) There is another use of the term ‘many-one’ (and *mutatis mutandis* for ‘one-one’, ‘one-many’, and ‘many-many’). On this alternate use, a two-place relation R is many-one just in case for all a and b such that aRb, things other than a bear R to b, but a bears R to nothing but b.

\[^{\forall x\forall y}{{[xRy→ (\exists z_1 R y\& z_1\neq x) \& (∀z_2 z_2 R y x=z_2)]}}\] van Inwagen (1994, 207n2) complains about Lewis’ usage in *Parts of Classes* (1991), which suggests that Lewis may have been one of the first to use the term in the way I have in mind.

\(^{18}\) It might be claimed that another important difference is that some of the relations can be captured by means of ‘makes it the case’ locutions, and others cannot. For example, such locutions sound much better in cases of microbased determination than cases of composition; ‘a’s being F and b’s being G make it the case that c is H’ is fine, while ‘a and b make it the case that c’ is not even grammatical. But this is just a shadow cast by the difference in relata. Only propositions or states of affairs can be “made the case”.

relations have in common. I also think that it is far from clear what, if anything, these \textit{prima facie} differences entail. What lessons should we draw about the relations among the building relations?

4. Relations Among the Relations

Before attempting any substantive reply, I need to clarify the question. What exactly are we asking when we ask about the relations among the building relations? There are really two sets of questions here, both of which I will address in due course. One set concerns the \textit{conceptual} relations among the building relations. Are these relations conceptually united enough to deserve an inclusive label? If so, what unites them? That is, in virtue of what are they all worth calling building relations? The other set of questions concerns the \textit{metaphysical} relations among the building relations. Do any building relations reduce to others? How should we count them? How many are there? How many fundamental—or at least relatively fundamental\textsuperscript{19}—ones are there?

There is a range of possible answers to that last metaphysical question. At one extreme is the claim that \textit{all} of the relations that I have introduced are distinct, relatively fundamental, and that each is just as fundamental as the others. This position is not very plausible, particularly in light of the fact that some building relations are partially defined in terms of others, as both micro-based determination and emergence are partially defined in terms of composition.\textsuperscript{20} However, there is a more plausible claim nearby. This less extreme view is that there are multiple equally fundamental building relations. I will call this ‘building relation pluralism’, after Kristopher McDaniel’s use of ‘compositional pluralism’ for the view that there is more than

\textsuperscript{19} A live question here is whether \textit{any} building relations are absolutely fundamental, in the sense that they are not themselves in any way built. (That is one notion of absolute fundamentality that is live in the literature; another is perfect naturalness. See my ms b.) I am currently inclined to think that the answer is ‘no’. For one reason, see Schaffer’s recombinability argument (forthcoming). For another reason, see Sider’s appeal to a principle he calls Purity (ms). For yet another reason, note that nominalists do not think that \textit{any} relations or properties are truly fundamental. Now, it’s clear that if I claim that all building relations are in some way built, I owe a response to the Bradley-style regress that appears to ensue. I will not do so here. I have brought the issue up for one and only one reason: it affects the definitions of building relation monism and pluralism. In the main text, I have characterized them in terms of relative fundamentality only, so that the question remains live even if no building relations are absolutely fundamental.

\textsuperscript{20} This is clear in the definitions and citations I provided in section 2 above. It is also worth mentioning that part of the reason that Polger (2007) and Polger and Shapiro (2008) do not want to take Gillett’s notion of ‘dimensioned realization’—basically what I call microbased determination—to be an account of \textit{realization} is simply that “the dimensioned view draws realization too near to material composition…. Gillett’s view is that when the carbon atoms compose the diamond, the properties of the carbon atoms realize the properties of the diamond. For Gillett, realization and composition go hand in hand” (Polger 2007, 248).
one fundamental composition relation. (Compositional pluralism is held in one form or another by McDaniel (2004), Richard Sharvy (1983), Peter Simons (1987), and Katherine Hawley (2006), and David Armstrong (1986, 1997, §8.2.).)

At the other extreme is the claim that there are no building relations at all, let alone relatively fundamental ones. Call that ‘building relation nihilism’. I will have little to say about building relation nihilism here; for present purposes, I will simply assume it to be false, though that is not obviously a fair assumption. Doing so allows me to again focus upon a slightly less extreme claim, which I will call ‘building relation monism’—namely, that there is a single most fundamental building relation. Prima facie, that may not sound very plausible either. It certainly does not sound plausible if it is understood to mean that the one most fundamental building relation is among those that I have already characterized, precisely as characterized. (Though one can certainly imagine some overzealous student of David Lewis championing mereological composition as the One True Building Relation!)

No, the more plausible way to think about the idea here is to think of the most fundamental building relation as the sort of extremely determinable relation that van Inwagen has in mind when he says—disapprovingly—that some philosophers see ‘part of’ as a transcendental or ‘high-category’ predicate—like ‘is identical with’ or ‘three in number’ and unlike ‘rising’—which can be applied to any sort of object and which always expresses the same very abstract relation (1990, 20).

The building monist’s primary claim is that there is a unique most fundamental, highly determinable, very abstract building relation \( R \). Beyond that, she has a choice. She might think that \( R \) itself is the referent of all of the standard building predicates—‘compose’, ‘constitute’, ‘realize’, etc—or she might simply think that each of those predicates picks out a less fundamental determinate, species, or type of \( R \).

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21 It is tempting to suggest that building relation nihilism entails that everything is fundamental—that there are no derivative entities—but that is not quite right. It will emerge later that although all building relations are relations of relative fundamentality, not all relations of relative fundamentality are building relations. So in principle there could be relations of relative fundamentality even in a world in which nothing is ‘built’. Nonetheless, this point is small, and one is not led too far astray by thinking of the building relation nihilist as claiming that the world is flat: no entities are more fundamental than any others.

22 L. A. Paul sometimes seems inclined to say this, but she assures me that it is not overzealous, merely zealous to exactly the right degree.

23 I intend to be fairly neutral here, largely because I do not think we yet have an adequate grasp what might be called “version of” relations. There seem to be plenty of cases where \( x \) is in some sense a kind of or version of \( y \), but is neither a determinate of \( y \) nor a species of \( y \) in the traditional senses (See Sanford 2006 and Funkhouser 2006 for overviews). So it is not clear that the determinate-determinable relation and the traditional species-genus relation
The conceptual and metaphysical questions are independent. Not every story about why a certain group of relations should all be called ‘building relations’ will by itself settle the question of how many fundamental relations that group contains. Some such stories will be compatible with there being several relatively fundamental relations that bear a family resemblance to each other, as well as with there only being one most fundamental relation. Similarly, not every answer to the metaphysical question will by itself settle the conceptual questions. In particular, the truth of building relation pluralism would not render those questions moot. Quite the contrary. The very coherence of the position—that there is more than one relatively fundamental building relation—requires the availability of a positive story about why we tend to lump them together, why they fall under some more or less unified concept, why they all deserve to be called ‘building relations’.

In sections 5 and 6, I will address the conceptual questions, first laying out some preliminary reasons to suspect that our various building concepts are at least cousins (§5), and then articulating the central features that they all share (§6). In section 7, I will address the metaphysical question. I will argue that building relation monism is more plausible than it might appear, for the most readily apparent arguments against it are not successful. However, I will also suggest that there may be a better argument in the offing.

5. The Conceptual Questions

There are (at least) three reasons to believe that our building concepts are intertwined. The first and most obvious one is the simple fact—already several times noted—that we use the various terms like ‘compose,’ ‘realize,’ ‘emerge’, ‘arise from’, or ‘get out of,’ in so many mixed up motley ways, with so many kinds of relata. It clearly takes more philosophical work to

are the only options here. Of the two, however, the determinate-determinable relation is a prima facie better candidate than the species-genus relation for characterizing building relation monism. There is no differentia that can be added to the generic R to yield familiar building relations like composition or grounding.

Yet note that if building relation monism is characterized in terms of the determinate-determinable relation—i.e. if the more specific building relations are taken to be determinates in the traditional sense of the one most fundamental building relation—then it must also be claimed that determinates are not always more fundamental than the determinables under which they fall. This strikes me as correct, even though the opposite is frequently assumed to be the case. Having mass, for example, is presumably a more fundamental property than having mass 2.187 grams. See Wilson ms for more discussion, and thanks to both Erica Shumener and Jeff Engelhardt for pointing this out to me.

24 Compare the fact that those who want to say that there is more than one fundamental composition relation need to shoulder the burden of saying why they all count as forms of composition. See McDaniel 2004, 2009; Hawley 2006.
precisify and distinguish the relations than it does to handwavingly gesture at the ballpark concept of building. The hard part is untangling the concepts, not showing that they are somehow related. Second, building relations license ‘in virtue of’ locutions—a composed object exists in virtue of its parts, a realized property is instantiated in virtue of the instantiation of its realizer, a microbased property is instantiated in virtue of the instantiation of its plural base, and so forth. Third and finally, notice that the two axes of difference I explained above—relata and unification—cross-classify the relations under investigation. Classified by relata, composition and constitution cluster together on one side of the line, and microbased determination, realization, and emergence cluster together on the other. But classified by whether they wrap their relata into one, composition and microbased determination cluster on one side of the line, and constitution and realization on the other (emergence, again, is a little unclear). Nonetheless—and this is the important point—both classifications seem equally natural. Neither axis is such a deep divide that we cannot lump together that which it distinguishes. The relations resemble each other in certain respects and not in others; that is all. There is a web of interrelated concepts here.

Can we do better than this? Is there an informative, non-circular set of necessary and sufficient conditions on a relation’s counting as a building relation? ‘Yes’ to the first; ‘no’ to the second. I cannot provide an informative and noncircular set of necessary and sufficient conditions, for there is none to be had. The notion of building is, I suspect, unanalyzable. However, I nonetheless can say more than I yet have; the fact that the concept cannot be given a reductive analysis does not entail that nothing informative can be said about it. In section 6, I will unpack and articulate what it is that all of these relations have in common in virtue of which they count as building relations in the first place. The account I am about to offer is necessary for a relation to count as building, and it is almost sufficient. It is clearly not a reductive analysis, but it is nonetheless informative and useful.

6. The Core Notion of Building

25 To say that building relations permit ‘in virtue of’ locutions is not to make the too-simple claim that a bears some building relation R to b just in case b in virtue of a. That depends upon the particular building relation, and thus also on the nature of a and b. If the relata are facts, then aRb might well yield the truth of ‘b exists in virtue of a’ or ‘the fact that b holds in virtue of the fact that a’, and so forth. See also note 18.
The core notion of building has three parts. I will introduce it in stages, and then respond to objections to my proposal.

6.1 The Account

First, all building relations are directed in the following sense: they are irreflexive and asymmetric—or, at least, they hold irreflexively and asymmetrically on the occasions on which their holding constitutes building.\(^{26}\) If \(a\) bears (or the \(a\)s plurally bear) a building relation \(R\) to \(b\), then \(b\) cannot bear \(R\) to \(a\), or to itself. One way to think of this requirement is that building relations have an input-output structure; they take in some relatum(a) and generate another. Note that proposed characterizations of specific building relations always require asymmetry and irreflexivity—for example, consider Lynne Baker’s definition of constitution (e.g. 2000, 2002) or Jonathan Schaffer’s sketch of grounding (2009).

However, this alone is obviously not sufficient; \textit{being taller than} is irreflexive and asymmetric, and decidedly not a building relation. So we add the second clause: the relata of a building relation always differ in how fundamental they are. Putting these two strands together, the claim is that a relation is a building relation just in case it is directed in the relevant sense, and the ‘input’ or base is in some sense more fundamental than the ‘output’.\(^{27}\) Building relations are relations of metaphysical priority.\(^{28}\)

This is much closer, and captures most of what is central to the notion of a building relation, but it is still not good enough. The problem is that \textit{being more fundamental than} or \textit{being mereologically simpler than} satisfy the condition, but are not themselves building
relations. After all, sodium ions are in an intuitive sense both simpler and more fundamental than benzene rings, but benzene rings are not even partially built out of sodium ions—sodium is simply not involved. A similar point holds for tokens of types that in general are building related. Hydrogen atoms and oxygen atoms are simpler and more fundamental than water molecules, but that does not entail that a particular water molecule in Ithaca is built out of hydrogen and oxygen atoms located in Miami. We do not yet have a grasp on the core notion. There is more to standing in a building relation than merely standing in a relative fundamentality relation.

We arrive at the third part of the core notion. What seems to be required is some kind of connection that is missing in the above cases. One tempting move is to appeal to mereological overlap (part-sharing). However, while that might help in the cases of composition and micro-based determination, it clearly won’t do as part of a general answer. Another tempting move is to go for something like spatial or spatiotemporal overlap—in any building relation, the input relatum(a) must be colocated with the output relatum(a). However, this will not do either, for two reasons.

First, the spatiotemporal colocation requirement is not necessary; a relation can count as building without involving colocation. To see this, note that people who believe in abstracta that are not spatiotemporally located can perfectly well think that those abstracta stand in building relations. Perhaps they are constituents of states of affairs; perhaps at least some of them are themselves built. For example, one can imagine a view on which the number 6 is an unlocated abstract object built out of the equally abstract and unlocated numbers 4 and 2. One can also imagine a view of universals that is similar to Armstrong’s except without the claim that universals are wholly located in their instances—that is, a view that claims that universals are unlocated rather than multiply located. Such a view could surely be combined with Armstrong-like claims to the effect that universals are involved in building relations: structural universals are built out of other universals, and states of affairs are built out of universals and particulars. So it seems to me that if there are any location-less abstracta—I take no stand on the matter here—their lack of spatiotemporal location does not prevent them from standing in building relations.

Thanks to David Braun and Earl Conee for pressing this objection.

29 Thanks to David Braun and Earl Conee for pressing this objection.
Second, the account thus far, supplemented with the spatio-temporal colocation requirement, still is not sufficient for a relation to count as a building relation. Consider the following view: there is a basic substance, ectoplasm, ghostly chunks of which float around and pass through ordinary concrete objects. A chunk of ectoplasm is more fundamental than, say, my coffee mug, and can be collocated with it. Because, as we have seen, being more fundamental than is itself asymmetric and irreflexive, this case meets the account of building currently under consideration. Nonetheless, there is no sense in which my coffee mug is built from the ectoplasm—they are just ships passing in the night, as it were. (This example derives from counterexamples that both Sider (2002) and Zimmerman (2002) raise against Baker’s definition of constitution (2000, especially 208-212).

So the needed notion of connection or overlap is not spatiotemporal. I am not sure that it can be unpacked any further, and will therefore leave it as a primitive. The resulting account says that a relation is a building relation roughly if and only if:

it is asymmetric and irreflexive, and
the ‘input’ relatum(a) is both more fundamental than the ‘output’, and in some sense overlaps it.

This is pretty thin, yes, but I believe it is all that can be said. The objections will now fly fast and furious. I will consider three of them. Be patient, and I will—I hope—get to yours in turn.

6.2 Objections to the Account of Building

The first complaint will be that the account is so thin as to not be substantive. After all, it relies on not one but two unexplicated notions. One of them is the notion of overlap that I have just discussed. The other is the notion of fundamentality. I have not said anything about how it is to be understood. Yet in the sense at hand, ‘fundamental’ appears to amount to ‘not itself built’, and ‘x is more fundamental than y’ appears to amount to little more than ‘x at least partially builds y, but y does not even partially build x’. 30 Similarly for ‘overlap.’ Both notions are not only unexplicated, but apparently unexplicatable in independent terms.

I agree that it is hopeless to expect definitions of the relevant notions of fundamentality and overlap that do not themselves invoke the notion of building. I also agree that this entails

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30 This is certainly a—if not the—central notion of fundamentality in the literature. (For one example, note how Schaffer defines fundamentality as ungroundedness in 2009, §3.1.) However, there are other notions run together with this in the literature, notably naturalness. See my ms b for more discussion.
that they cannot be used in a reductive analysis of building. But I disagree that this means that my articulation of the core notion illuminates nothing. It is, after all, an articulation, not an analysis, and building is hardly the only concept that apparently can only be unpacked by means of other, closely related concepts. Compare modal notions, moral notions, and indeed, mereological notions—the last of which are subsumed under building. van Inwagen points out that it is not possible to define ‘compose’, ‘part’, and ‘sum’ independently. Notions from within the “mereological circle” form a “closed family of concepts” (1990, 51). The same is true here. The notions of building, fundamentality, and overlap are intimately intertwined, and the fact that my articulation of building brings that out is no flaw.

Still, though, one might well wonder whether there is a real problem lurking here. The concern about substantivity generates a second objection, about extensional adequacy—in particular, that the account is not sufficient. Without an independent understanding of the notions of fundamentality and overlap, we have little ground on which to rule out certain relations that don’t intuitively seem to be of a piece with composition, constitution, and the like. One particularly problematic case is causation. Isn’t this, says the objector, a relation which is not a building relation despite being ‘directed’ in the relevant sense, and such that the input side is more fundamental than the base? It is asymmetric and irreflexive, and the input relatum is—in the usual case—earlier than the output relatum. I have said nothing to rule out counting temporal precedence as a kind of fundamentality. I also have said nothing to rule out counting causal connection as the right sort of overlap. Without meatier definitions of fundamentality and overlap, how can I avoid calling causation a building relation?

There is an obvious fix: add a further necessary condition on a relation’s counting as a form of building, namely that it be synchronic, or at least atemporal. Building relations do not unfold over time. If property \( P \) realizes property \( Q \), it does so at some time \( t \); if these molecules compose that table, they do so at some time \( t \); if these time slices compose that persisting object, they do so simpliciter. Causation, in contrast, is paradigmatically diachronic, and that idea is

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31 I do not mean to assume that causes always precede their effects—perhaps backwards causation is possible in cases of time travel (Lewis 1973, 566). But certainly, typical instances of the causal relation hold between earlier and later events. (The remarks in this note also apply to the suggestion in the main text that causation is irreflexive and asymmetric.)

32 Thanks to Penelope Mackie for pressing this objection.

33 Four-dimensionalists who believe that persisting objects are mereological sums—or built in some other, non-mereological way—of temporal parts need to believe in an atemporal building relation. That tempestuous teenager timeslice is part of me simpliciter, not at a particular time. See Sider 2001, 55-60.
frequently invoked to distinguish causation from relations like composition, constitution, or supervenience—relations that I am calling kinds of building.

Yet although this is a tempting solution to the problem, occasionally temptation is best resisted. This is one of those occasions. We should not require that building relations be synchronic, because there is at least one important relation that is worth calling a building relation, but that unfolds over time. I explore this in detail elsewhere (ms a). For present purposes, consider the relation that holds between, for example, eggs, butter, sugar, and flour on the one hand, and some cookies on the other. The cookies are certainly partially made from the eggs, but no eggs are part of them—certainly not in the way eggs might be part of an Easter basket or the contents of a refrigerator. The eggs do not exist once the cookies do. Consequently, there is no time \( t \) at which the eggs and other ingredients are parts of the cookies, and no time at which they compose the cookies in the usual mereological sense. Nonetheless, I claim that the relation between those ingredients and the cookies is a building relation, even though it is not synchronic. Properly defending that claim, and fully exploring this partly compositional and partly causal relation would clearly take us too far afield. For present purposes, I simply wish to note that I want to allow room for nonsynchronic building relations.

Consequently, I do not know how to bolster the account so that garden-variety causation clearly fails to count as a building relation. I readily admit that I have little independent grip on the notions of fundamentality and overlap. Explanation runs out here; the notion of building cannot be further unpacked in independent terms. Perhaps we should thump the table and insist that causation just doesn’t count. Or perhaps we should instead bite the bullet and accept that causation is indeed a form of building—though a liminal and penumbral one. The trick to biting that bullet is to think of later stages of the world as being built from earlier ones. (For further discussion of the radical idea that causation \textit{is} a building relation, see ms a.)

The third objection to my account is that it is not necessary; a relation need not meet it to count as a building relation. In particular, the objection is that emergence—one of the five relations that I have been treating as paradigmatic cases of building—does not meet it. The reason is that it is not clear that a genuinely emergent property is any less fundamental than its base. Indeed, those who believe in emergent properties often claim that they are \textit{basic}, despite being in some sense dependent upon the properties or states of affairs from whence they emerge (see in particular Chalmers 2006; O’Connor and Wong 2005). However, it is important to see
that that combination not only characterizes emergence, but also at least partially explains why it strikes many of us as so very odd. Emergent properties are supposed to be both somehow built-up from and dependent upon the base properties, yet also fundamental.\textsuperscript{34} I in fact think it is actually a virtue of my proposed necessary condition that it is not clear whether or not emergence meets it. I think that’s precisely the right result. Emergence is a hybrid or chimera;\textsuperscript{35} it is part building relation and part… something else.

Those three concerns—about substantivity, sufficiency, and necessity—are the primary direct objections to my account of the core notion of building. In addition, however, one might think that the account could be fleshed out more, with the addition of further necessary conditions. I have already rejected the idea that synchronicity is required, but there might be others. One such condition in particular might seem natural even though it would do nothing to help prevent causation from counting as a building relation—namely, that no relation can count as a building relation that is what I shall call ‘disunifying’. A relation is unifying if it is many-one, a relation is disunifying if it is one-many. (Relations that are one-one or many-many are neither unifying nor disunifying.) Building relations need not be unifying—as discussed above, many are one-one—but they must not be disunifying. The proposal, then, is that no one-many relation can be a building relation.

Here, too, temptation is best resisted; the proposal should not be adopted. It goes too far beyond the core notion. Such a requirement would entail that grounding and truth-making do not count as building relations, for one fact can ground many others, and make true many propositions. The most extreme version of this is a view that I have already mentioned—Jonathan Schaffer’s priority monism (2010a, b). He thinks that the entirety of the universe—the One—is fundamental, and grounds all other ‘smaller’ facts. He does not deny the existence of things like airplanes, apples, and aches; he just thinks that they are ontologically derivative from the whole, rather than the other way around. I don’t believe the view, but I do think that if it were correct, we should continue to count grounding as a form of building. In other words, we should take Schaffer’s view to be that there is an awful lot of one-many, disunifying building. We should not require that no building relations be disunifying.

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\textsuperscript{34} See also Bedau’s sketch of why emergence is a “perennial philosophical puzzle” 1997, 375.

\textsuperscript{35} ‘Chimera’ in its lesser-used sense; see OED entry 2 and 3c.
It is hard to deny that there is a core notion of building. The various building relations are conceptually interwoven, and there is a reasonably straightforward criterion for whether a relation counts as a form of building. Building relations are asymmetric, irreflexive relations that somehow connect more fundamental things to less fundamental ones. They are often synchronic or atemporal, but need not be.

7. The Metaphysical Question

Even if all of that is right, though, none of it settles anything about how many fundamental building relations there are. Everything I have said is consistent with both building relation monism and building relation pluralism. Even the pluralist should agree that the various building relations are conceptually connected, that there is at least family resemblance here. So let us switch gears, and tackle the metaphysical question head-on. How many fundamental building relations are there? Or, to ask a marginally easier question, should we be monists or pluralists?

Clearly, the popular—if unarticulated—answer is that we should be pluralists. This is suggested by the extent to which the various building relations are discussed separately in the literature. It is also suggested by the fact that, to my knowledge, no one else has even claimed that the various building relations form a conceptually unified family—let alone that there might, at bottom, only be one basic building relation. Finally, it is suggested by the reactions of those who have heard early drafts of this paper. The pluralist assumption runs deep.

However, it is not at all clear that it is justified. Building relation monism can be given a better defense than one might think. The most obvious argument against building relation monism is a bad argument. The most obvious follow-up to that initial argument is also a bad argument. And while there is a third argument against monism that could in principle succeed, its success depends on the truth of substantive and controversial further claims. Since these claims are beyond the scope of this paper, I will not claim to fully argue against the third strategy here. Nonetheless, I will suggest that its prospects also look fairly bleak.

In this section, I will explain and deflect each of these three arguments in turn. Let me be clear that my aim is not to show that building relation monism is true, but rather to undermine the case against it. Building relation pluralism certainly should not be assumed without argument—and contra appearances, building relation monism is a live and defensible option.
The first bad argument against building relation monism derives from a natural first reaction to the view: “look, of course the relations are distinct. Didn’t you spend §3 telling us how different they are from each other?” To expand this first reaction into an argument, we simply need to note that it is surely necessary, though perhaps not sufficient, that identical relations be extensionally equivalent and share all formal properties. So, quite generally, there are two easy strategies for arguing that two relations are distinct. First, we can look for ordered pairs in the extension of one relation that are not in the extension of the other. Second, we can launch what amount to Leibniz’s Law arguments by pointing out that one relation is, say, transitive and the other is not. To see these strategies in action, consider how they can be used to show that the is a brother of relation and the is a sister of relation are distinct. Those relations are not extensionally equivalent, and the relations themselves have different features. One requires that a male occupy the first position; the other a female.

Combined with the discussion back in §3, these strategies yield straightforward arguments for the claim that the five building relations under discussion are distinct. The relations have different logical form, and take different kinds of relata. For example, recall that composition is a many-one relation on objects, and realization a one-one relation on properties or property instances. So they are not extensionally equivalent, and violate Leibniz’s Law in other ways as well. Presumably it follows that they are distinct relations.

Matters are actually more complicated than I am letting on, but let us grant for the sake of argument that such reasoning successfully shows that the relations are distinct. The problem is that it is not the needed conclusion. It does not conflict with building relation monism. Building relation monism is not the claim that there is only one building relation; it is the claim that there is only one most fundamental building relation. And the considerations so far do not falsify that—after all, there might simply be more than one less fundamental building relation. To see the point here, consider again the is a brother of and is a sister of relations. The claim that they are distinct is perfectly consistent with the claim that they are both species of a single more fundamental relation—namely, is a sibling of.

Similarly in the case of the building relations. The claim that composition, constitution, realization, micro-based determination, and emergence are distinct relations is perfectly

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36 It is actually left open that all of the different relational predicates refer to the single fundamental determinable relation that I explore in the following paragraphs.
consistent with the claim that they are all less fundamental species of a single more fundamental relation. And, as I mentioned in §4, this is the only plausible version of building relation monism—that all of the more familiar, more determinate relations are species of a single most fundamental relation \( R \) that is highly determinable and very abstract. Indeed, the monist can even claim that the core notion I sketched in §6 is not merely a list of the features shared by the various building relations, but is instead a characterization of \( R \).

So the pluralist owes us further argument. And it is clear what she will say. She will argue that although all of the everyday building relations may well be species of a single, very general relation, that general relation will be less fundamental rather than more. This gives us the second bad argument against building relation monism. Premise 1: The differences between the more familiar, more determinate, building relations are such that any relation determinable or general enough to subsume them all would have to be really very general. It would need to subsume one-one relations and many-one relations, as well as relations that take relata from different ontological categories. Premise 2: any relation that general would have to be a gerrymandered disjunction, less natural and less fundamental than any of the more specific building relations it subsumes. Conclusion: there cannot be a building relation \( R \) that both subsumes and is more fundamental than the familiar versions.

This argument is not sound. Although the first premise is true, the second is not. The only reason for believing it rests upon either of a closely related pair of false assumptions. One is that no single, natural, unified relation can take relata from such a wide variety of ontological categories. The other is that no single, natural, unified relation can sometimes hold in a one-one way, and sometimes in a many-one way. In either case, the idea is that the differences between the standard building relations show that they cannot be determinates of a common determinable that is more fundamental than they are.

But that reasoning is clearly flawed. Plenty of reasonably natural relations take relata from a wide variety of ontological categories. Spatial relations like being two feet from or being underneath are good candidates. An object can be two feet from an event, and events can be two feet from each other. A sea battle can be underneath an air battle in precisely the same way that a rug is underneath a table. Such examples provide no pressure whatsoever to think that spatial
relations are somehow gerrymandered, or that being underneath is really a disjunctive relation: being underneath\textsubscript{object-or-being underneath\textsubscript{event}.}^{37}

Similarly, plenty of reasonably natural relations can take either singular or plural arguments into one or all of their argument places.\textsuperscript{38} Consider, for example, the relation is equinumerous with, or perhaps the relation carries. Both can take either a singular or plural argument into one or both of their slots (the former relation only requires that they match in number). Yet it is very plausible to think that the carrying relation is the same when I carry a platter and when you and I together carry some planks. And it is similarly plausible to think that the spoons are equinumerous with the forks in just the same way that the sun is equinumerous with Paris. These are not isolated examples; there are countless others. Indeed, Byeong-Uk Yi thinks it plausible that many relations are like this (2005, 481).\textsuperscript{39}

Or consider the identity relation. Everyone thinks that the identity relation holds between relata of all sorts of ontological categories. This stapler is this stapler, the number four is the number four… and so on and so forth for events, states of affairs, properties, tropes, relations, and whatever else your ontology contains. It is not the case that there is one identity relation on material objects, and a distinct one on, say, states of affairs; it is the same relation. We can characterize the identity relation disjunctively—for example, as identity\textsubscript{object-or-identity\textsubscript{state of

\textsuperscript{37}A more careful version of this argument would instead begin with the claim that there are lots of relational predicates that certainly appear to be able to take as arguments terms referring to a variety of sorts of things. The ‘is two feet from’ predicate can take as arguments terms referring to objects, events, and various other (spatially located) ontological categories. The following sentences are equally well-formed, at least ignoring the fact that we often don’t have tidy nouns for events:

(1) the cat is two feet from the squirrel.
(2) the boiling of the kettle is two feet from the whirring of the blender.

This more careful version continues by explicitly moving from talk of the predicates to talk of the relations to which the predicates refer. There is absolutely no pressure to think that those two sentences invoke different relations. If they did, it would have to either be the case that English contains two distinct but homonymous ‘is two feet from’ predicates, or else that the single predicate ‘is two feet from’ surreptitiously picks out different relations on different occasions of use. But there is no reason to believe either claim. Indeed, there is reason to believe that the predicates pick out the same relation in those two sentences—namely, that (1) and (2) entail

(3) the boiling of the kettle is the same distance from the whirring of the blender as the cat is from the squirrel.

Thus to deny that a single relation can take a variety of kinds of relata requires thinking not only that we are drowning in relations, but also that our predicates are semantically pretty tricky.

\textsuperscript{38}Here too, a more careful version of the argument would instead begin with the claim that there are lots of relational predicates that appear to be able to take either singular or plural arguments into one or all of their argument places. See note 37, though in this case I will leave the details to the reader.

\textsuperscript{39}Yi’s claim is actually about predicates, not relations. In his terminology, ‘carries’ and ‘is equinumerous with’ are neutral predicates (2005, 480-481, including n66). He says that a neutral argument place is one that can take either a singular or plural argument, and that a neutral predicate is one that has at least one neutral argument place. Yi then suggests that “most, if not all, of the predicates of, e.g., English are neutral predicates” (481).
affairs—or-identity...—but that disjunction is more natural than its disjuncts, not less. The identity relation is not gerrymandered; rather, such disjuncts are artificially restricted.\textsuperscript{40} Further, it is at least arguable that the identity relation holds both one-one and many-many.\textsuperscript{41} If so, it is not the case that there is a singular identity relation and a distinct plural identity relation, and, again, the disjunction identity\textsubscript{singular}-or-identity\textsubscript{plural} is more natural than its disjuncts.

All of these examples show that a unified and nondisjunctive relation can take relata from a variety of ontological categories, and can take either singular or plural variables into either or both argument places. So there is no reason to believe the second premise of the above argument—that any relation general enough to subsume all of the building relations must be gerrymanded, unnatural, and less fundamental than the particular building relations it subsumes. And, indeed, there is not only no reason to think that claim true, but at least some positive reason to think it false. The discussion of \S 6 constitutes reason to think that such a general relation can be given a unified characterization that does not seem gerrymandered at all. Thus far, then, we have no good argument against monism. The claim that a single most fundamental relation cannot subsume all of the building relations is no more successful than the first argument’s quick appeal to Leibniz’s Law.

This brings us to the third argument.\textsuperscript{42} Here is a schematic version. Suppose that there are things $x$ and $y$\textsuperscript{43} and some time $t$\textsuperscript{44} such that $x$ bears building relation $R_1$ to $y$ at $t$ (and not vice

\textsuperscript{40} Another example is a controversy about existence. Many people, myself included, think that there is only one fundamental form of existence (see Sider forthcoming for further explanation and defense). Others think that there is more than one—that there are many “ways of being” (see McDaniel 2009 and Turner ms for further explanation and defense; both also document the historical primacy of the view). One way to think about the dispute is this: the former sort of people think that although we can of course restrict our quantifiers to a particular ontological category, there is only one fundamental quantifier. The latter sort of people think that the various ‘smaller’ quantifiers—over material objects, over properties, etc—are not mere restrictions on the basic quantifier, but are in fact more fundamental. On this view, the generic “there is” is in fact gerrymandered. (See Turner ms \S 2 for further discussion of this characterization of the dispute.)

It is interestingly hard to see how to adjudicate this dispute in particular, or disputes of this form in general. Note that in the main text I do not exactly argue that there is only a single fundamental identity relation. I merely point out that that certainly appears to be the received view.

\textsuperscript{41} The alternative is either to take singular identity as fundamental, and define plural identity in terms of it, or to take plural identity as fundamental and define singular identity in terms of it (see McKay 2006, 128-129).

Note that the single number-neutral identity relation would be different from the single fundamental building relation $R$ whose existence we are considering, in that the identity relation never holds many-one. (Or does it? See Baxter 1988a, b.) But that is a fact about the nature of identity in particular, not about the nature of relations in general.

\textsuperscript{42} Mark Heller suggested the gist of this to me.

\textsuperscript{43} Or things(es?) $xx$ and $yy$, or $xx$ and $y$, etc. I only frame the argument in terms of singular variables for simplicity.

\textsuperscript{44} Or interval $t_{1-n}$. Recall that I did not require that building relations be synchronous. The case simply requires that $x$’s bearing $R_1$ to $y$ be simultaneous with $y$’s bearing $R_2$ to $x$. 
versa), and \(y\) bears a different building relation \(R_2\) to \(x\) at \(t\) (and not vice versa). This is compatible with \(R_1\) and \(R_2\)’s being species of a common, more fundamental relation \(R\). But any such \(R\) would hold wherever \(R_1\) and \(R_2\) do, and thus would have to be such that \(x\) bears \(R\) to \(y\) and \(y\) bears \(R\) to \(x\) — i.e., \(R\) would have to be symmetric. But I have argued that the core notion of building is asymmetric, and we surely want to maintain that claim. It cannot both be the case that \(x\) exists or is instantiated in virtue of \(y\) and that \(y\) exists or is instantiated in virtue of \(x\); it similarly cannot both be the case that \(x\) is more fundamental than \(y\) and that \(y\) is more fundamental than \(x\). It follows that \(R_1\) and \(R_2\) cannot be species of a common, more fundamental building relation \(R\), and thus that building relation monism is false.

The question, of course, is whether such a case is possible. Are there any cases in which two things simultaneously bear different building relations to each other? A couple of possibilities have been suggested in the literature for independent reasons. I will quickly sketch two of them.

One example arises in the context of Schaffer’s priority monism. Recall that he thinks that the entirety of the universe grounds the existence and properties of, say, this vase. The vase is built out of the One, rather than the other way around. Yet it also is presumably the case that the vase is part of the entirety of the universe — that the One is composed of the vase, the desk on which it sits, my car, and everything else in the universe. So the vase (along with a lot of other things) bears the composition relation to the One, but the One bears the grounding relation to the vase and its properties.

The other example involves what has been called ‘downward causation’, and should be more generally called ‘downward determination’. Jaegwon Kim characterizes a synchronic version as follows:

At a certain time \(t\), a whole, \(W\), has emergent property \(M\), where \(M\) emerges from the following configuration of conditions: \(W\) has a complete decomposition into parts \(a_1\ldots a_n\); each \(a_i\) has property \(P_i\); and relation \(R\) holds for the sequence \(a_1\ldots\)

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45 To see this, consider the following case, which has the same structure. I bear the is a sister of relation to Steve, and Steve bears the is a brother of relation to me. Those relations are both species of the more general is a sibling of relation, which we each also bear to each other. This is all consistent with the assumption that the latter is more fundamental than the two former relations.

46 Schaffer is actually neutral about how the One grounds everything, i.e. about the priority structure of the world other than the claim that the One is the only ungrounded entity (2010, 44).

47 Most of Kim’s more well-known discussions of “downward causation” are discussions of the diachronic case, in which \(W\)’s having \(M\) at \(t\) causes \(P\) to be instantiated at a later time. For example, this is where the exclusion problem and worries about the violation of the causal completeness of physics arise. Kim distinguishes the cases in his 1999, and discusses the diachronic case in detail in many places, e.g. 1993, 1999, and 2006.
For some $a_i$, $W$’s having $M$ at $t$ causes [or in some other way determines] $a_i$ to have $P_j$ at $t$ (1999, 28).

Kim himself thinks that this is impossible, and emergentists usually deny that they are committed to anything of the sort. But a small handful of people have recently defended something in the ballpark (Bishop 2008, Gillet ms). They think that there are cases in which $M$ is realized or microbased in the properties of $W$’s parts, but $M$ also in some other way—Gillett calls it ‘machretic determination’—determines the properties of $W$’s parts.

However, there are two problems with these examples. The first is that in neither case is it quite true that $y$ is $R_1$-built from $x$ and $x$ is $R_2$-built from $y$. Rather, it is only true that $y$ is $R_1$-built from $x$ and $x$ is partially $R_2$-built from $y$. In the Schaffer case, for example, the One grounds the existence and nature of the vase, while the vase plus everything else in the universe composes the One. The One is only partially built composition from the vase. Set this aside, though, for the other problem is probably worse.

The other problem is obvious: these are extremely controversial cases. Both involve substantive claims that are endorsed by only a handful of people. Indeed, they are endorsed by even fewer people than it might appear. For either of the two examples to constitute an instance of the third argument against building relation monism, it has to not only be claimed that the relevant relations hold in the relevant directions, but also that they are both building relations. And that means that Schaffer himself would not endorse the argument. Although he does think that the One grounds the vase, and that the vase partly composes the One, he does not think that this tells against building relation monism at all. That’s because he does not think that composition is a building relation in my sense (2010; personal communication). He does not think that there is any sense in which composite objects, solely by dint of their compositeness, are less fundamental than their parts. So not even Schaffer would use the above pattern of reasoning to claim that his priority monism supports building relation pluralism.

In short, the trouble with the third argument is that it rests on a claim that is at least as controversial as—probably more controversial than—the view it is designed to support. It rests on the claim that there is some $x$ and $y$ such that $x$ bears building relation $R_1$ to $y$ at $t$ (and not vice versa), and $y$ bears a different building relation $R_2$ to $x$ at $t$. Perhaps my imagination is lacking, but I cannot think of an uncontroversial case that would fit the needed pattern. The

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48 Or there are some $xx$s and some $yy$s; again, the singular variables are for simplicity only.
monist will and should simply deny the premise; he should simply argue that no such case is possible. That is, he should endorse the following principle:

if x bears (or the xxs bear) some building relation to y (...), y cannot bear any building relation to x.

The point is only that the pluralist has no dialectical advantage here. She certainly does not have an argument against building relation monism that proceeds from premises that the monist is antecedently inclined to accept.

I have considered three arguments against building relation monism. All have failed. The existence of three failed arguments against a view certainly does not entail that the view is true. However, in the absence of any good arguments against the view, it does entail that the view is not to be dismissed out of hand. And that is all I claim. Building relation monism is not obviously false; building relation pluralism should certainly not be assumed without argument. Thus far, it remains a live possibility that there is only one fundamental building relation.

8. Wrapping Up

I have argued that there is a core notion of building, from the more fundamental to the less fundamental, that unites a seemingly disparate collection of relations. I have provided an account of that core notion which is informative though by no means reductive. And I have argued that all of the familiar building relations introduced in §2 might actually be species of a single more fundamental relation.

Each of the more specific building relations has received, and will rightfully continue to receive, individual attention. But it is instructive also to pull back and look at the bigger picture here. We philosophers spend a lot of our time precisifying and distinguishing, separating and untangling. I’m all for it. But occasionally something can be learned from lumping notions together rather than from pulling them apart. Sometimes it is good to zoom out rather than zoom in. I think that this is one of those occasions.
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