

Reviews

Making Things Up

By Karen Bennett

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The central thesis of Karen Bennett's long-anticipated book is that reality is *built*; that the world is structured in such a way that some things depend on other things, and that the building relations that structure reality form an interestingly unified class. Bennett's view is different in subtle but significant ways from what might now be considered orthodoxy. Where much of the recent literature proceeds as though there is a single privileged building relation (e.g. *grounding*), Bennett thinks of the building relations as a family, none of which is privileged. This family includes: composition, constitution, set formation, realization, grounding, and (controversially) causation. These relations all (according to Bennett) involve some sort of generation or production, are all directed, and all connect less fundamental entities to those that are more fundamental.

The relations Bennett mentions are all fairly familiar examples of dependence relations (both causal and non-causal) but Bennett's terminology turns dependence on its head. The terminology of building is forwards-looking rather than backwards-looking, and this seems better to capture what is purportedly going on at the metaphysical level. The language of building is Bennett's own, and this makes the discussion seem fresh and (to an extent at least) unconstrained by other accounts of related notions.

One of the more surprising aspects of Bennett's view is her inclusion of causation amongst the building relations. It has been common in the contemporary literature to distinguish causal from non-causal dependence, and to think only of the latter as connected to accounts of metaphysical structure, and to notions such as fundamentality. Bennett calls the causal building that occurs over time *horizontal* building, and the non-causal building that we might think of as related to fundamentality (connecting the lower levels of reality to the higher levels) *vertical* building. It is generally taken for granted that causal relations relate the temporally prior to the temporally posterior, and non-causal building relations relate the metaphysically

Reviews

fundamental to the derivative. As such, these causal and non-causal relations have traditionally not been thought to form a unified class.

In fact, even that is a bit of a stretch, since most people think of fundamentality as connected to or to be analysed in terms of one privileged relation (often *grounding*), even if they also recognise other sorts of dependence as playing an important role in metaphysics. Bennett's arguments focus on the ways in which all building is 'causally tainted'; not only does causation count as a building relation, but some vertical building relations are themselves causal. Bennett's main argument for this latter claim is that (vertical) building processes can unfold over time. Maintaining a sharp divide between horizontal and vertical building (or a failure to include causation amongst the building relations) is therefore to be considered a mistake.

It is fairly obvious that some things (houses, for example) are built over time, and so there is a diachronic, causal component to their coming into existence. It is also fairly clear that we should want to say that a completed house is built (composed, perhaps) from the bricks that are parts of it. The question is whether these really are two aspects of a unified 'diagonal' building process. Bennett argues that this diagonal relation is not fundamental, but is itself built out of horizontal and vertical components, and then gestures at arguments that will be picked up at the end of the book for the existence of nonfundamentalia. But this is to change the subject. Our concern was neither with the existence nor with the fundamentality of causation; it was with whether the causal relation is a member of a unified class of building relations. One might plausibly maintain that causation merely facilitates genuine (vertical) building, and that there is no reason to infer that causation is itself a building relation. (Note that many other relations might also facilitate (vertical) building, e.g. spatiotemporal proximity might facilitate composition; necessitation might facilitate grounding.)

Because Bennett thinks of causation as a kind of building, and of building as connecting more fundamental entities with less fundamental entities, it follows that the causally prior is more fundamental than the causally posterior. One of the main advantages of Bennett's account is that it includes a systematic analysis of fundamentality-talk in terms of building. Bennett claims (102) that 'both absolute and relative fundamentality can be, and can only be, understood in terms of building'. The connection between fundamentality and building can be expressed via two key principles:

Independence: x is independent if and only if x is not built by anything (105)

$B \rightarrow MFT$: for all x and y , and all building relations, if x at least partly builds y , then x is more fundamental than y (63)

The details (especially for the relative fundamentality captured by $B \rightarrow MFT$) are somewhat complicated (see chapter 6), but Bennett in no way shies away from the consequence that causes are more fundamental than their effects.

The key to reconciling this *prima facie* radical claim with our intuitions that causation is ‘flat’ (it unfolds horizontally), and that less fundamental things can sometimes cause more fundamental things (e.g. my pressing a button causing the movement of an electron) is Bennett’s contention that just as building is always indexed to a particular relation, so is fundamentality. My cat is more fundamental_{setmembership} than her singleton set, but she probably isn’t more fundamental_{composition} than that set. My pressing the button is more fundamental_{casuation} than the movement of the electron, but not more fundamental_{composition}. This indexing allows Bennett to offer a deflationary account of fundamentality such that to say that a cause is more fundamental than its effect is ‘just a new way of saying’ (168) that the cause causes its effect.

Bennett promised a systematic connection between building and fundamentality, even when causation is included amongst the building relations. She delivers on that promise: relative fundamentality facts just are building facts; absolute fundamentality is just building-independence. But when we unpack it this feels a tiny bit disappointing. Most of the fundamentality-talk we come across in the literature concerns a non-indexed notion, and indeed most of Bennett’s discussion in chapters 5 and 6 is not given in terms of the indexed notion of fundamentality_R that is her official concern. One is left with the suspicion that Bennett has not offered an adequate characterisation of what it was we were interested in in the first place. This isn’t altogether surprising. Much recent discussion of fundamentality proceeds on the assumption that there is a privileged building relation, but Bennett denies this. Given that Bennett offers a deflationary account of fundamentality in terms of building, if there is no big-B building, perhaps we shouldn’t expect there to be any big-F Fundamentality either. But it’s not entirely clear the extent to which Fundamentality talk can be paraphrased into or replaced by fundamentality_R talk, and so Bennett’s view might have some fairly radical consequences for the practice of metaphysics which are not explored in the text.

A connection with fundamentality such that the builder is more fundamental than what it builds is common to all building relations,

Reviews

but Bennett doesn't take this to be characteristic of building (rather the fundamentality facts fall out of the building facts). The features that Bennett does take to characterise the class of building relations are: (i) directedness (building relations are irreflexive and antisymmetric); (ii) necessitation; and (iii) generativity. Many relations of different kinds have their directedness built in, and (as Bennett notes) some have denied that some of the relations Bennett identifies as building relations do have these features. (ii) is not specific to the class of building relations (identity relations for example, are also necessitating). (ii) also requires rejecting any purported cases of indeterministic causation. Bennett is happy to accept this consequence, but others might be less willing to do so. These two features of building thus don't seem to point to any interesting unification, because they are not specific to building, and might be called in to question for some building relations.

Characterisation (iii) seems to be the most interesting of the features that Bennett attributes to building relations, and the most distinctive. The built exists or obtains *in virtue of* its builders. But Bennett's treatment of generativity is surprisingly brief, and relies on an intuitive understanding of what it is for one thing to exist or obtain in virtue of another. Whilst it seems right to maintain that builders generate what they build, it's not clear that this works very well as a characterisation of building (or rather, it seems to work a little too well). It's tempting to think that generativity might encapsulate directedness, and that if not (if there could be cases of mutual generativity) that it would be a mistake to include a directedness constraint on building. It's also hard to imagine what it would be for generation to be non-necessitating in Bennett's sense (a sense according to which when A fully causes B, $\Box[(A + C) \rightarrow B]$, where C is that appropriate circumstances hold). To say that one entity is generated by another seems like just another way of saying that the latter builds the former. This threatens to make the sense in which the relations are unified a little too easy to achieve: building relations are unified in that they are all building relations.

It would be nice at this point to return to the connections between building and fundamentality: perhaps a unifying feature of the class of building relations is that they license claims about fundamentality. But Bennett's official position is that the obtaining of a particular building relation only licences claims about fundamentality indexed to that relation, and nothing more. This offers some unification, but it is perhaps not sufficient to motivate taking the building relations to form an interestingly unified class.

The penultimate chapter of Bennett's book contains fairly technical material concerning whether building is itself built. The discussion will prove most interesting for those already invested in the tradition in which she is working, but the arguments here are intriguing. The discussion in the final chapter has more general appeal; it is here that Bennett argues that reality really is built. Bennett calls the view according to which there are no building relations *flat-worldism*, and understands it as claiming that everything is fundamental. (Note though that this is perhaps a slightly unfair way to describe the view, as the flatworlder might resist fundamentality-talk altogether and so deny that anything is fundamental.)

It is in this final chapter that Bennett offers some general arguments for building over flatworldism, one of which is a commitment to the thought that 'it is in some sense better to explain things than to leave them fundamental' (221). If the category of building relations were a category of relations that do a certain kind of explanatory work in metaphysics, this might be a reason to be interested in a general class of such relations, and thus a way to unify the members of that class. Bennett explicitly rules out supplementing her account with the claim that building relations are explanatory in any epistemic sense (61). She *does* think that building relations are explanatory in a *metaphysical* sense of the word, but this is no more a unifying feature of the relations than is their connection to fundamentality. Just as fundamentality is to be indexed to particular building relations, so too should explanation be. The parts of my cat might explain_{composition} my cat, but they don't explain_{causation} her.

There is a narrow path to tread between the twin claims that the building relations are interestingly unified, and that there is no privileged Building relation. Some of the things Bennett says as a consequence of the latter commitment put pressure on the former. Bennett's characterisation of building is arguably less informative than it first appeared. Fundamentality turns out to be about building, but only in the sense that fundamentality-talk is to be given a deflationary analysis in terms of particular building relations. The initially exciting claim that causation is a building relation is rendered much less remarkable once we see that this just amounts to including causation amongst a class of relations that are directed, necessitating, and generative (and few would want to deny that causation has these features as Bennett understands them).

Perhaps there is a little less to unify the building relations than we might have hoped, but Bennett's book-length treatment of building is undoubtedly a central contribution to the literature on dependence

Reviews

and fundamentality, and is essential reading for those working on such topics.

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Reduction and Emergence in Science and Philosophy

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Primarily an original work of metaphysics, Carl Gillett's *Reduction and Emergence in Science and Philosophy* proposes and develops a new philosophical framework for understanding the ideas of scientific reductionism and emergentism. The exposition aims to be refreshing, and its findings are claimed to be shocking. The book's bilateral goals, of reviving a stagnant philosophical dialectic while also assisting a resolution of the stalemate in the scientific debates, are to be achieved by bringing the philosophical understanding of scientific reductionism and emergentism in line with the ideas espoused by scientists. Indeed a welcome surprise is the book's focus on the mundane: it is not concerned with the peculiarities of quantum mechanics, nor those of phenomenal consciousness. The stated methodology of the work also offers relief from previous philosophical discussions – which, Gillett argues, have either suffered from their fixation upon purely semantic accounts, or from their taking the wrong approach to the relationship between science and metaphysics. The shocking conclusions reveal how 'dead wrong' the previous philosophical understandings of reductionism and emergentism are, compared with the actual 'live views' identified by Gillett.

The book opens with some grand quotes from Robert B. Laughlin and Alfred North Whitehead, which Gillett uses to colourfully paint the scientific debate over reductionism and emergentism as a 'Battle of the Ages': a perspective that shades the work throughout. Gillett points out that scientists (including the condensed-matter physicist, and Nobel laureate, Laughlin) have been having exciting debates about Big Questions concerning such things as the nature of composition and aggregation, varieties of determination, and the character of fundamental laws – and they have been doing so very publicly, and with great significance. Meanwhile, Gillett laments, philosophers