Justin Clarke-Doane

Columbia University

Modal Objectivity[1]

It is widely agreed that the intelligibility of modal metaphysics has been vindicated. Quine's arguments to the contrary supposedly confused analyticity with metaphysical necessity, and rigid with non-rigid designators.[2] But even if modal metaphysics is intelligible, it could be misconceived. It could be that metaphysical necessity is not absolute necessity – the strictest real (non-epistemic, non-deontic) notion of necessity – and that no proposition of traditional metaphysical interest is necessary in every real sense. If there were nothing otherwise "uniquely metaphysically significant" about metaphysical necessity, then paradigmatic metaphysical necessities would be necessary in one sense of "necessary", not necessary in another, and that would be it. The question of whether they were necessary simpliciter would be like the question of whether the Parallel Postulate is true simpliciter – understood as a pure mathematical conjecture, rather than as a hypothesis about physical spacetime. In a sense, the latter question has no objective answer. In this article, I argue that paradigmatic questions of modal metaphysics are like the Parallel Postulate question. I then discuss the deflationary ramifications of this argument. I conclude with an alternative conception of the space of possibility.

[1] Thanks to Hartry Field for encouraging me to develop these ideas. I presented them at my Honours seminar on meta-modality at Monash in 2012, and in graduate and undergraduate seminars at Columbia in 2015. I am grateful to attendees for their feedback. Thanks also to audiences at the University of Aberdeen, Australian National University, the University of Birmingham, CUNY Graduate Center, the University of Delaware, the University of Washington, and the 2015 NYC *Night of Philosophy*. Thanks to Walter Dean, Melissa Fusco, Melvyn Fitting, Toby Handfield, Lloyd Humberstone, Nick Jones, Philip Kitcher, Boris Kment, Dan Korman, Harvey Lederman, Wolfgang Mann, Colin Marshall, Jennifer McDonald, Toby Meadows, Christia Mercer, John Morrison, Chris Mortensen, Daniel Nolan, Chris Peacocke, Graham Priest, Michael Raven, Greg Restall, Carol Rovane, Ian Rumfitt, Chris Scrmabler, Jeff Sebo, Alex Silk, Jon Simon, Aaron Sloman, Shawn Standefer, Eric Steinhart, Scott Sturgeon, Achille Varzi, Katja Vogt, Jared Warren, Dan Waxman, Zach Weber, and Alastair Wilson for discussion.

[2] See Quine [1943] and [1947].

According to this conception, there is no objective boundary between possibility and impossibility. Along the way, I sketch an analogy between modal metaphysics and set theory.

1. Metaphysical and Absolute Necessity

Modal metaphysics has been centered on "metaphysical" necessity.[3] But what is that? Perhaps the most informative answer lists the metaphysical necessities directly. They are said to include the logical truths, mathematical truths, truths of fundamental ontology (such as that there are, or are not, properties, propositions, or possible worlds), grounding truths, identity truths, bridge laws, mereological truths, theological truths, explanatorily basic normative truths, and more.[4]

Metaphysicians' focus on metaphysical necessity is noteworthy. There are evidently other real (non-epistemic, non-deontic) notions of necessity besides metaphysical necessity. That is, there are other notions of necessity whose possibilities are really ways the world could have been – rather than ways it epistemically must be or morally ought to be, for example.[5] For instance, physical necessity is evidently a real notion of necessity.[6] What is uniquely "metaphysically significant" about metaphysical necessity?

---

[3] This is not to deny that there are philosophers who give pride of place to other notions of necessity, or to a plurality of them, including metaphysical necessity. See Lange [1999], Fine [2002], and Kment [2006, Sec. 3.2] and [2014, Ch. 2], for example.
[4] Sider [2011, Ch. 12] advocates defining "metaphysical necessity" in terms of such a list. Nothing in this article hangs on how that term is defined, however. There will be a way to state the conclusions of this article given any definition of that term (even if it is *defined* as "absolute" necessity – more on this below). (Henceforth, I will alternate between talk of necessity and possibility when this is natural and the difference is unimportant.)
[5] Other authors use "objective", "ontic", "alethic", "genuine" or "non-epistemic" instead of "real". Note that a real notion of necessity, in the relevant sense, need not "carve at the joints", or, as I will say, be "metaphysically significant". I return to the metaphysical significance of various real notions of necessity in Section 6 and Section 8.
[6] There are some philosophers who hold that metaphysical necessity just is physical necessity, but this is not the standard view. See fn. 46.

There is an obvious answer. Metaphysical necessity is *absolute* necessity. A proposition, P, is absolute just in case, for any real notion of necessity, [N], [N]P. And a notion of necessity, [A], is absolute just in case [A] is real, and if [A]P, then (the proposition) P is absolute. Equivalently, if []P ←→~<>~P, then P is absolute just in case, for every real notion of possibility, <N>, ~<N>~P. And a notion of possibility, <A>, is absolute just in case <A> is real, and if ~<A>~P, then (the proposition) P is absolute.[7] A proposition is absolute when it is necessary in every real sense, and a notion of possibility, or necessity, is absolute when it is the most inclusive, or strictest, real notion of possibility or necessity, respectively.

Many philosophers all but stipulate that by "metaphysical" they mean absolute. Lewis [1986], Kripke [1980, 99], van Inwagen [1997], and Williamson [2016] are explicit about this. Van Inwagen writes that if P is metaphysically possible, then it is possible "*tout court*. Possible simpliciter. Possible period…. possib[le] without qualification [1997, 72]", and Williamson claims that "metaphysical modality [is] the maximal objective [real] modality [2016, 460]."

Note two things about the obvious answer to the question above. First, it assumes that we know what we mean by "real" necessity (or by "a way the world could have been"). This is not obvious. For example, a notion of necessity is not real just when it is alethic in the sense of satisfying *(T) []P → P*. *It is known that* satisfies (T), despite being an epistemic operator.[8] Nor is a notion of necessity real when it is *not* defined in terms of intuitively epistemic or deontic

[7] Hale [1996, 101] gives a similar definition of "absolute", but does not require that [A] be real. The qualification is important though, for reasons that will become clear in Section 8 (where the notion of an absolute proposition, as opposed to an absolute notion of necessity, will also be important). (To express these ideas in a formal system, one might try to work in a multi-modal logic which proves [Ni]P→[Nj]P, for all P, when [Ni]P→[Nj]P. Models would be triples, <W, {Ri : i ϵ {1, 2, 3…}, V>, with the condition that Rj ⊂ Ri. But I believe that such a formulation is inadequate, for reasons discussed in Section 8. Thanks to Lloyd Humberstone for discussion.)

[8] See Hale [2013, 104]. Thanks to Harvey Lederman for discussion.

concepts. Mortensen's trivial notion of necessity (Mortensen [1989]), according to which literally nothing is necessary (and everything is possible), is not defined in terms of intuitively epistemic or deontic concepts. But it had better be "merely epistemic" in the relevant sense if the obvious answer is to get off the ground.[9] Of course, one could just *define* a notion of necessity to be real if it meets some condition met by all and only notions of necessity that are at least as weak as metaphysical necessity. But then the question would become: what is uniquely metaphysically significant about "real" necessity?[10] In what follows, I will assume that the distinction between "real" and "merely epistemic" notions of necessity makes sense. However, the position that I will ultimately advance has affinity for the view that it does not. (The main question I will consider is whether, *given* that the distinction makes sense, there is a principled reason to believe that the metaphysical possibilities exhaust the real possibilities.) Second, the view that metaphysical necessity is absolute would be false if conceptual or (strict) logical necessity were real. Part of the standard view is that it is not. Whether this is a defensible position will emerge in what follows.

In what sense would an absolute notion of necessity be "uniquely metaphysically significant"? In the sense that an absolute – i.e., most inclusive – notion of set would be. It would constitute the ultimate court of appeals for questions of the relevant sort. Just as all notions of set could be understood as restrictions on the absolute notion of set, if there were one, all real notions of necessity could be understood as restrictions on the absolute notion of necessity. For any real notion of possibility and necessity, <N> and [N], we would have <N>A ←→ <M>(T & A) and

[9] See Section 8 for a discussion of Mortensen's trivial notion of necessity.
[10] Williamson comes close to partially *defining* a real ("objective") notion of necessity as one for which the Necessity of Identity holds [Williamson 2016, 454]. Nothing turns on such terminological decisions, however.

[N]A ←→ [M](T→A), where <M> and [M] are metaphysical possibility and necessity, respectively, and T is the (perhaps empty) conjunction of uniquely N-necessities (i.e., all P such that [N]P, and for any real notion of necessity, [A], if [([A]P→[N]P) & ~([N]P→[A]P)], then ~[A]P).[11] For example, if metaphysical necessity were absolute, then it would be physically necessary that nothing travels faster than the speed of light just in case it was metaphysically necessary that nothing travels faster than the speed of light, given the laws of physics.

2. Grounds for Possibility Claims

In order to assess the obvious answer to the question that began this paper – "what is uniquely metaphysically significant about metaphysical necessity?" – it will be helpful to rehearse our epistemic grounds for judging that a proposition is possible in some real sense. On what grounds do we judge that <>P, for paradigmatic metaphysical possibilities, P? Of course, *given* some modally saturated data points – i.e., some propositions that either include the concepts of possibility or necessity, or entail propositions that do – our grounds may be abductive [Williamson 2013, 423—4]. We may judge that those data points are "best systematized" or "best explained" by thesis that <>P. (Alternatively, we may judge the opposite. For example, perhaps the "best systemization" of the data that it is not possible that Euclid's Theorem fails, that Bolzano's Theorem fails, that the Well-Ordering Theorem fails, and so on would be that, for any mathematical truth, it is not possible that it fails.) But the peculiar problem for the epistemology of modality concerns the data points themselves. On what epistemic grounds do

[11] Although this is the standard view, it can be questioned. See Van Fraassen [1977] and Fine [2002]. (Note that T may not be finite, so I am not working in a typical modal language here. Also, when there are no uniquely N-necessities, then one must drop off the → or &.)

we make the *epistemically basic* modal judgments that we make – such as, perhaps, that it is possible in some real sense that you failed to read this paper?[12]

There are three grounds familiar from the epistemology of modality literature.[13] According to the first, we judge that <>P on the ground that we can conceive of P. Descartes claims that we "know that everything which [we] clearly and distinctly [conceive] is capable of being created…so as to correspond exactly with [our] understanding of it [Cottingham et al., 54]."[14] What does it take to conceive of P? As Arnauld noted, it cannot just take being able to doubt that ~P. One "may doubt…that the square on the hypotenuse [of a Euclidean triangle] is equal to the squares on the other two sides", he writes [Cottingham et al., 141-2]. But it is not metaphysically possible that this is so. Conceiving that P requires imagining a "positive" scenario, S, that one takes to verify that P [Yablo 2003, Section X]. Perhaps this does not require picturing S. We can imagine scenarios that could not be contents of perception, such as those involving molecules or invisible creatures [Chalmers 2002, Section 2]. Nor, presumably, does it require imagining a whole world in which S obtains [Yablo 2003, Section X]. What it requires is imagining S in enough detail to convince one's self that S is coherent, and that P is true in S.[15]

[12] The view that there are epistemically basic modal judgments does not imply that there are modal judgments that are immune to revision in light of theoretical considerations. Even the coherentist methodology of reflective equilibrium proceeds from initial plausibility judgments.
[13] I will discuss other grounds in Section 6. See Vaidya [2016] for an overview.
[14] Descartes himself thought that the link between conceivability and possibility needed to be proved by appeal to a benevolent God, but contemporary epistemologists of modality have not followed him in this. (Thanks Colin Marhsall for discussion.)
[15] For Chalmers, only ideal conceivability of a certain sort *guarantees* metaphysical possibility. But even he believes that we can be (defeasibly) justified in taking propositions to be possible in some real sense. By "we can conceive that P", I mean what Chalmers might express with "it seems to us that it is conceivable that P".

Note two things about this ground for judging that a proposition is possible. First, we are supposed to have an independent grip on the relevant sense of "coherent". If "coherent" just meant *L-consistent*, for some logic, L, or *L-consistent with truths, T*, then the conceivability of the L-validities or the T-truths being different would be ruled out by stipulation. This would just invite the question: why think that conceivability but not "shconceivability" is a guide to real possibility – where shconceivability is just like conceivability, but the L-validities and T-truths being different is shconceivable? Second, it is commonly added that, just as we judge that P is possible on the ground that we can conceive of P, we judge that P is impossible on the ground that we cannot conceive of P. Just as we might judge that you could have failed to read this paper on the ground that we can conceive of your doing so, we might judge that you could not have both failed to read it and not failed to read it (at the same time, to the same degree, and so forth) on the ground that we cannot conceive of your doing so.

The second ground on which we are sometimes said to judge that <>P is that it is not the case that had it been that P, then a contradiction would have obtained – i.e., ~(P []→⊥).[16] In other words, we judge that "had it been the case that P, then a contradiction would have obtained" is non-vacuous. On the standard semantics for counterfactuals, (P []→ Q) can only be false if there is some world in which P is true. Assuming that there is no world in which a contradiction is true, the falsity of (P []→⊥)implies the possibility of P. (Likewise, if we could argue that, indeed, (P []→⊥), then we could conclude that ~<>P. Given that there is no world witnessing a contradiction, the fact that any P-world would witness one tells us that there is no P-world.) For

[16] Williamson [2007] might be interpreted as claiming this. I am not sure what epistemological problem Williamson is trying to solve. He could be trying to justify (in the dialectical sense), to explain the justification, or to explain the reliability of our modal judgments. For the distinction between these projects, see my [2015].

example, perhaps we judge that it is possible in some real sense that you failed to read this paper on the ground that it is not the case that had you failed to read this paper, snow would have been both white and not white. Our "counterfactual development" of the antecedent fails to yield a contradiction. (In this sense, "our fallible imaginative evaluation of counterfactuals" may have "a conceivability test for possibility and an inconceivability test for impossibility as fallible special cases" [Williamson 2003, 163].) Of course, once we have some modal beliefs, we can apply additional counterfactual reasoning to obtain many more. For example, if we know that <>P, and can argue that (P []→ ~Q), then we may conclude that <>~Q as well. Alternatively, if for any possible P that we can think of, we find that (P []→ Q), then perhaps we can abduct that []Q.

Note that not everyone accepts the standard semantics for counterfactuals. Accordingly, not everyone agrees that we can infer <>P from ~(P []→⊥). I am not endorsing the view that counterpossibles are vacuous. I am merely pointing out that some philosophers suggest that our ground for judging that <>P is that ~(P []→⊥). What will matter in what follows is whether the P for which ~(P []→⊥) seems true include paradigmatic metaphysical impossibilities.

The third ground on which we are said to judge that <>P is that it has no defeater.[17] Consider textbook modal error. We judge that it is possible that Hesperus is not identical to Phosphorus. But, given that ~<>~P←→[]P, the possible non-identity of Hesperus and Phosphorus implies that Hesperus is actually not identical to Phosphorus or that the Necessity of Identity, VxVy[(x = y) →[](x = y)], fails, and we did not intend to deny that if Hesperus = Phosphorus, then this is

[17] See Yablo [1993], Sec. XIII, for something like this idea, and Wright [1986] for a precursor.

necessarily so. In alleging that, possibly, Hesperus is not identical to Phosphorus, we were really just registering suspicion that, actually, Hesperus is not identical to Phosphorus (Kripke [1980, 103-4]). Evidence that Hesperus = Phosphorus defeats our judgment that, possibly, Hesperus is not identical to Phosphorus. Similarly, suppose that we judge that it is possible that the Twin Primes Conjecture is false, but accept the Peano Axioms and classical logic. If we are then given a proof of the Twin Primes Conjecture from the Peano Axioms, then we will retract our judgment. We did not intend to claim that what follows from what was contingent. We were simply registering uncertainty about what does follow from what. If, however, we are in a position to rule out empirical or logical defeaters like the ones above, then the third ground for judging that <>P is satisfied too.[18]

Of course, the above defeaters only defeat if we are antecedently committed to the Necessity of Identity and to the necessity of logical truths. If we are doubtful that if Hesperus = Phosphorus, then this is necessarily so, then learning that, actually, Hesperus = Phosphorus should not lower our credence that, possibly, they are not the same. I will return to this situation in Section 4.

There is an additional ground on which we are sometimes said to judge that <>P. This is that we have an "intuition" that it is possible that P, in some real sense of "possible". This is often taken to be another way of saying that we can conceive of P. But some take intuition to be a *sui generis* mental state.[19] On this view, our ground for judging that it is possible in some real sense that you failed to read this paper is that it *seems* to you that this is so – in the sense that it seems to you (falsely) that, for every predicate, there is a set of things satisfying it, or (truly) that

[18] See the quotation from Rosen in Section 3 for an illustration of this kind of reasoning.
[19] See Bealer [2002].

torturing children just for the fun of it is wrong. Since the question to follow is tantamount to whether there is a principled reason to think that we do *not* have an intuition that paradigmatic metaphysical impossibilities are possible in some real sense, I will mostly bracket this ground in what follows.

3. Metaphysical Necessity is Not Absolute

There is a tension between the obvious answer to the question that began this article – "what is uniquely metaphysically significant about metaphysical necessity?" – and the grounds that we actually advance for judging that propositions are possible in some real sense. If we judge that P is possible in some real sense on the familiar grounds above, then we ought to judge that paradigmatic metaphysical impossibilities are possible in some real sense as well. If they are, however, then there is a proposition, P, such that it is possible in some real sense that P, though it is not metaphysically possible that P. In other words, metaphysical possibility is not absolute.

Consider, for example, the mathematical truths. Again, these are paradigmatic metaphysical necessities. However, taken at face-value, mathematics is about entities, like numbers, sets, and tensors. As Russell [1919, 203] underscored, it seems possible to conceive of a world without *anything*. But if there were no mathematical entities, then the mathematical truths would be different. Every existentially quantified such truth would be false, and every universally quantified such truth would be vacuous. Moreover, the appearance that it is possible in some real sense that there are no mathematical entities does not seem to be vulnerable to standard modal defeaters. It does not seem to depend on any outstanding empirical or logical conjectures. Perhaps this is why the platonism-nominalism debate seems intractable. As Rosen writes,

> [Nominalists]s believe that numbers do not exist....[Y]ou know perfectly well what they think....When we work...through the nominalist's system...we encounter neither contradiction nor manifest absurdity….[I]f [there is an incoherence], there must be some nonmodal fact given which it is palpably absurd to suppose that there might have been no numbers. But...[w]e cannot imagine what it could...be [2002, 292-4].[20]

Can we non-vacuously assess counterfactuals conditionalizing on the non-existence of mathematical entities? It certainly seems so. "Had there been no mathematical entities, there would not have been prime numbers greater than 1000" seems true, while "had there been no mathematical entities, there would have been prime numbers greater than 1000" seems false.[21]

It might be thought that this just shows that the philosophical truths about mathematics could be different, not that the mathematical truths could be. Mathematics *per se* is committed to truths of the form, roughly, *if* there are mathematical entities, *then* standard axioms are true (and if standard axioms are true, then so are standard theorems). The antecedent of this conditional could fail even if the conditional as a whole could not. But similar considerations suggest that the conditional as a whole could fail. It is not just that we seem to be able to conceive of it failing. Many philosophers and mathematicians believe that it *does* fail. Even if we disagree, it is very hard to maintain that their position is *inconceivable*, or that we are incapable of non-

[20] See also Dorr [2008].
[21] See Nolan [1997, 538] for a similar point. See Balaguer [1995, 317] and Field [1993] for the suggestion that there could have failed to be mathematical entities.

vacuously counterfactually conditionalizing on it. Nor does the appearance that it is possible that the relevant conditional fails seem to turn on outstanding logical or empirical conjectures.

For concreteness, let us focus on a canonical mathematical axiom, the Axiom of Foundation, which says that every set occurs at some level of the cumulative hierarchy. This axiom can be written: $V=U\alpha(V\alpha)$. $V=U\alpha(V\alpha)$ is the key assumption behind the standard "iterative conception of set". It rules out sets that contain themselves, as well as sets with infinitely-descending chains of membership. Can we conceive of the Axiom of Foundation failing, i.e., $V\neq U\alpha(V\alpha)$? Of course we can. Advocates of non-well-founded set theories have gone to extraordinary lengths to characterize the way the set-theoretic universe would be if there were, e.g., a universal set (which would contain itself).[22] They have not just formally derived consequences from the assumption that there exist such sets, as one would in a proof by contradiction. They have characterized intended models of theories implying $V\neq U\alpha(V\alpha)$, models that anyone can imagine and evaluate, whether or not one thinks they in fact exist.[23]

Nor does the counterfactual, "had $V\neq U\alpha(V\alpha)$, then $\perp$" seem vacuously true. "Had $V\neq U\alpha(V\alpha)$, then every set would have contained a ϵ-minimal element" seems obviously false. But if it is, then $V\neq U\alpha(V\alpha)$ is true at some world (on a standard semantics). Given that $\perp$ is true at no world, "had $V\neq U\alpha(V\alpha)$, then $\perp$" is false as well. I do not deny that "had $V\neq U\alpha(V\alpha)$, then $\perp$"

[22] See, for instance, Holmes [1998].
[23] Again, one could simply stipulate that anything inconsistent with the actual laws of mathematics is "inconceivable". But absent an independent reason to treat the actual laws of mathematics differently from the actual laws of, say, physics, the "inconceivability" of alternative mathematics, in this sense, should no more compel us to deny the real possibility of alternative mathematics than the inconsistency of alternative physical laws with the actual laws of physics compels us to deny the real possibility of alternative physics.

would be true *if $V\neq U\alpha(V\alpha)$ were absolutely impossible*. My point is that one cannot *argue* that $V\neq U\alpha(V\alpha)$ is absolutely impossible on the grounds that "had $V\neq U\alpha(V\alpha)$, then $\bot$" *seems* true.[24]

(One might respond that, for pretty much *any* alleged "metaphysical" necessity, p, the claim that had it been the case that ~p, it would have been the case that $\bot$ seems non-vacuous. However, even if this were true, this would at most show that the alleged absolute necessity of *pretty much any p* is itself unmotivated. Indeed, this is part of the position that I will ultimately advance.)

Perhaps there is a direct counterfactual argument for ~<> $V\neq U\alpha(V\alpha)$? It is hard to see what it could be. It is provable that standard set theory minus $V=U\alpha(V\alpha)$ plus $V\neq U\alpha(V\alpha)$ is consistent if standard set theory itself is consistent. So, if one can argue that had it been the case that $V\neq U\alpha(V\alpha)$, then it would have been the case that $\bot$, then, apparently, one can already argue that had it been the case that standard set theory was true, $\bot$ (unless, that is, one had independent reason to think that $V\neq U\alpha(V\alpha)$ was absolutely impossible). We might try to argue that it is absolutely impossible that $V\neq U\alpha(V\alpha)$ by inductively supporting the generalization that had it been the case that P, then it would have been the case that $V=U\alpha(V\alpha)$, for *all possible* P. However, this does not hold for all antecedents which seem to be conceivable, and which seem to figure into non-vacuous counterfactuals. Just consider: "had some set contained itself."

---

[24] That is, I am not denying the thesis of Williamson [Forthcoming]. The more speculative sections, 8 and 9, do have relevance to Williamson's discussion, but exploring this would take us too far afield. It is noteworthy that Williamson often discusses counter*logicals* in this context. But these are not representative of counterpossibles. (Again, some philosophers – e.g., "modal primitivists" (Cameron [2009], deRosset [2014], Stalnaker [1976], and Wang [2013]) – might not agree that the apparent non-vacuity of a counterfactual is evidence for the real possibility of its antecedent. I do not mean to take sides in this debate. My point is merely that the standard grounds we advance for judging that <>P, *whether good or not*, seem to work equally to show that, e.g., <>($V\neq U\alpha(V\alpha)$). Thanks to an anonymous referee for pressing me to make this explicit.)

Finally, the appearance that it is possible in some real sense that $V \neq U\alpha(V\alpha)$ does not seem to turn on outstanding conjectures about the actual world. Unlike <>(Hesperus ≠Phosphorus), the appearance that <>[$V \neq U\alpha(V\alpha)$] does not go away once it is recognized that, actually, $V = U\alpha(V\alpha)$. Even if no set contains itself, it seems that the set-theoretic universe could have been otherwise. Of course, there may be *some* real sense of "necessary" in which $V = U\alpha(V\alpha)$ seems to be necessary. Again, there is some real sense in which the laws of physics seem to be necessary, even given that they are not metaphysically necessary. The point is that there is another sense of "possible" that appears to have equal claim to being real in which it seems possible that the set-theoretic truths could have been different. We can precisely describe ways in which they could have been such that $V \neq U\alpha(V\alpha)$.

To sum up: the grounds that we *actually advance* for judging that paradigmatic metaphysical possibilities are possible seem to serve equally to show that at least some paradigmatic metaphysical impossibilities – namely, the negations of the axioms of pure mathematics – are too. (I focused on the Axiom of Foundation, but the axioms of Choice, Replacement, Least Upper Bound or even Induction would have served my purposes equally.[25]) Of course, these considerations do not *entail* that alternative mathematics is possible in some real sense. But they do raise the question: what is the principled reason to think that it is *not*? Absent a satisfactory answer to this question, the assumption that alternative mathematical laws are "absolutely impossible" ought to be met with comparable suspicion as the suggestion that alternative physical laws are absolutely impossible.

[25] For challenges (which do not bottom out in outstanding logical or empirical conjectures) to Choice and Replacement, see Potter [2004]. For challenges to the Least Upper Bound Axiom, see Kilmister [1980]. For challenges to Induction, see Nelson [1986].

4. The Generality of the Problem

The problem with the Axiom of Foundation is actually very general. The grounds that we *actually advance* for judging that paradigmatic metaphysical possibilities are possible seem to serve equally to show that all manner of paradigmatic metaphysical impossibilities are too.

Consider moral truths. Moral realists are widely agreed that (explanatorily basic) such truths would be metaphysically necessary[26]. But, again, not only do we seem to be able to be able to conceive of the actual moral truths failing. Many philosophers believe that they *do* fail. Even if we disagree, their position certainly seems to be conceivable. If deontology or consequentialism is not just false, but *inconceivable*, then nothing of interest is plausibly conceivable. Nor do counterfactuals conditionalizing on different moral truths seem to be vacuous. An influential formulation of "Evolutionary Debunking Arguments" requires this. As Joyce writes,

> Suppose that the actual world contains real categorical requirements – the kind that would be necessary to render moral discourse true. In such a world humans will be disposed to make moral judgments…for natural selection will make it so. Now imagine…that the actual world contains no such requirements… nothing to make moral discourse true. In such a world, humans will still…make these judgments…for natural selection will make it so [2001, 163].

[26] Explanatorily basic moral truths are the conditional truths that fix the conditions under which a moral property is instantiated.

Joyce is challenging the counterfactual that had there been no (atomic) moral truths, we would not have had any moral beliefs. This counterfactual does seem to be false. It seems that had there been no (atomic) moral truths, our moral beliefs would have been the same. It still would have benefitted our ancestors to have the same moral beliefs. Of course, one can accept that such "counter-morals" are non-vacuous while denying that they undermine our moral beliefs.[27] The point is not the Evolutionary Debunking Arguments are sound. The point is that such arguments cannot be dismissed on the grounds that counter-morals *seem* to be vacuous.

Again, one could try to give a direct counterfactual argument for ~<>(There are no moral truths). But there does not seem to be an argument that had there been no moral truths, then a contradiction would have obtained. (Famously, some philosophers allege that had there *been* moral truths, then a contradiction – or incoherence – would have obtained [Mackie 1977])!) Nor does there seem to be an argument that for all propositions that *seem* possible, P, had it been the case that P, then there would have been moral truths. For example, it seems possible that there could have been no normative truths of any kind. But, had there been none, then there would have been no moral truths. Finally, the appearance that there could have been no moral truths does not seem to be vulnerable to standard modal defeaters. Again, unlike <>(Hesperus ≠Phosphorus), the appearance that <>(There are no moral truths) does not go away once it is recognized that, actually, there are moral truths.

There are many other examples that illustrate the point. For example, many philosophers believe that the propositions below are actually true. Again, even if we disagree, it is very hard to

[27] See my [2016] for an argument to this effect.

maintain that their truth is inconceivable, or that we cannot non-vacuously counterfactually conditionalize on it (or that had they been true, a contradiction would have obtained). What is the relevant difference between the propositions below and alternative mathematical truths? (The parenthetical negations indicate that there is disagreement over the proposition.)

> [Ontology] There are (not) universals.[28]
>
> [Theology] There is (not) a God.[29]
>
> [Grounding] The grounding relation is (not) well-founded.[30]
>
> [Mereology] If A and B are objects, then there is (not) a C = AuB.[31]
>
> [Epistemology] (It is not the case that) one ought believe p if and only if one's evidence supports p.[32]

To simply declare that it is merely "epistemically possible" that the above propositions are true *without contesting the grounds above with respect to them* is blatantly question-begging.

It might be thought that at least origin and identity truths could not fail, in any real sense, to hold. But, on the contrary, we *seem* to be able to conceive of scenarios in which such truths fail, and to be able to non-vacuously counterfactually conditionalize on their failing. As Kment writes, "Thatcher is not my mother, and I think that it is [metaphysically] necessary that she is not. But I do not think that it is true to say that, if Thatcher were my mother, she would (still) not be my

[28] See, e.g., Quine [1948].
[29] See, e.g., Rowe [2007, 262]. (Of course, some disagreements over the existence of God turn on outstanding empirical or logical conjectures. The point is that not all do.)
[30] See, e.g., Schaffer [2009] or Raven [2015].
[31] See, e.g., Lewis [1986, 212-213] or van Inwagen [1990].
[32] See, e.g., Connee and Feldman [1985] or DeRose [2000].

mother [2006, 248]."[33] Whether or not we call this scenario "impossible", it does not seem to be "inconceivable" in any useful sense. We can reason about it exactly as we would any other scenario. Of course, one could respond that it merely *appears* as though we are conceiving of the scenario in question. Perhaps we are really just going through the motions. But what reason could there be to believe this? After all, one could equally claim that it merely appears as though we are conceiving of a physically impossible scenario when we reason about something traveling faster than the speed of light. How do we rebut the latter charge without rebutting the former? (Again, one could stipulate that a content is "conceivable" only if we can reason about it, and, additionally, it respects the origin and identity truths. But, of course, this would just raise the question: why suppose conceivability, but not "shconceivability, is a guide to real possibility – where shconceivability is just like conceivability, but something can be shconceivable without respecting the origin and identity truths?) Even if the Necessity of Origins and the Necessity of Identity hold for *metaphysical* necessity, there seems to be little reason to believe that they hold for every real notion of necessity.[34]

5. No Metaphysically Substantial Notion of Necessity is Absolute

I have argued that the grounds that we advance for judging that paradigmatic metaphysical possibilities are possible in some real sense serve equally to show that all manner of paradigmatic metaphysical impossibilities are possible in some real sense as well. There is, thus, no principled reason to believe that metaphysical possibility is absolute. But even if metaphysical possibility is not absolute, another metaphysically substantial notion of necessity

[33] See Wilson [1983] and Priest [2012, 374] for examples involving identity claims. (For a case like Kment's, note that it seems false that, e.g., if Quine had been Trump, then Quine still would not have been Trump.)
[34] For a statement of the Necessity of Origins, see Kripke [1980, 114, fn. 56].

could be. By *metaphysically substantial* notion of necessity, I mean a notion of necessity according to which a significant array of paradigmatic metaphysical necessities are necessary.

In light of what has been argued, however, this does not seem to be so. Beginning with the metaphysical necessities, we may now consider increasingly strict notions of necessity, or inclusive notions of possibility, all of which seem to have equal claim to being “real”.

> N_0 = metaphysical necessity
>
> N_1 = metaphysical necessity minus the mathematical truths
>
> N_2 = metaphysical necessity minus the mathematical and mereological truths
>
> N_3 = metaphysical necessity minus the mathematical, mereological, and fundamental ontological truths
>
> N_4 = metaphysical necessity minus the mathematical, mereological, fundamental ontological, and theological truths
>
> …

The notions of necessity listed above are totally ordered by what we might call the *more absolute than* relation, where $[N_k]$ is *more absolute than* $[N_j]$ just in case, for any P, $[N_k]P \rightarrow [N_j]P$, but not conversely (the *at least as absolute as* relation can be defined by allowing the converse to hold). This might suggest that there is a hierarchy of metaphysical significance, as one retreats to increasingly absolute modalities. But not all apparently real notions of necessity that one can define are related by the more absolute than relation. Consider, for instance, the notion of necessity, [N*] defined by taking the metaphysically necessary truths and removing just the existential truths, and the notion of necessity, [N**], by taking the metaphysically necessary truths and removing just the normative truths. Then, for select P, ~([N*]P→[N**]P), and, for select P, ~([N**]P→[N*]P). That is, neither notion of necessity is more absolute than the other.

Of course, it does not follow that all notions of necessity that one can define (by relativization or restriction) are on a metaphysical par.[35] There are various dimensions along which one might "rank" notions of necessity. For example, some philosophers privilege notions of necessity whose necessities are counterfactually independent of all other truths, or true throughout a certain sphere of worlds around actuality (Lange [1999] and [2009], Kment [2006] and [2014: Sec. 1.1, Ch. 2]). Others give pride of place to L-necessity, for select formal logics, L (Field [1989, Introduction]). I will return to the suggestion that not all notions of necessity are created equal in Section 6 and Section 9. But, however "metaphysically significant" such notions are, no one can deny that, say, [N*] is a real notion of necessity in the sense discussed in Section 1 – given that one concedes, that is, that it is possible in some real sense that nothing existed.

The picture that has emerged, then, is one of a wide array of real notions of necessity, with no total ordering by relative absoluteness. Moreover, virtually no proposition of traditional metaphysical interest seems to be N_x-necessary, for every x. Of course, *if* there is an absolute notion of necessity, *then* there are some absolute necessities. For example, if L-necessity is absolute, for some logic, L, then the absolute necessities include the L-validities. But they do not include any of the kinds of propositions typically considered by modal metaphysicians, such as

[35] Fine discusses these two strategies for defining new notions of necessity in his [2002, Sec. 1]. Note that, e.g., metaphysical necessity could be defined by restriction as (strict) logical necessity, given the "metaphysical laws".

those considered in the previous two sections. I will return to the question of whether there is an absolute notion of necessity, albeit much stricter than metaphysical necessity, in Section 8.

6. Unique Significance

I have argued that there is no principled reason to believe that metaphysical necessity, or any other metaphysically substantial notion of necessity, is absolute. The obvious answer to the question that began this paper – "what is uniquely metaphysically significant about metaphysical necessity?" – is, therefore, without support. However, it might be argued that a non-absolute notion of necessity is nevertheless "uniquely metaphysically significant". What could "unique metaphysical significance" amount to, if not just absoluteness? Nolan [2011], drawing on Lewis [1983] and Sider [2011], appeals to the notion of "naturalness". Nolan writes,

> [S]ome of the relative modalities are more "natural" than others....If we add...that this naturalness gives rise to increased "eligibility", so that this "joint in logical space" is more fit to be picked up as a semantic value of a use of "necessarily" or "possibly" than nearby divisions that fit usage similarly well...a privileged metaphysical feature of the world can be referred to...[2011, 322].[36]

This suggestion is *prima facie* puzzling. It is like the suggestion that the notion of well-founded set is "uniquely metaphysically significant" even though $V \neq U\alpha(V\alpha)$ (i.e., even though the well-founded sets do not exhaust the sets). If the Axiom of Foundation fails in the universe of all sets

[36] Nolan does not here distinguish between the case where there is a uniquely metaphysically significant restricted notion of necessity and the case where there are multiple non-uniquely metaphysically significant restricted notions of necessity. The former case is the one that is relevant presently. I discuss the latter case in Section 9.

(it holds in the well-founded sets), is there any sense in which that axiom is “fundamentally” or “deeply” true? If not, then in what sense would the notion of well-founded set be “uniquely metaphysically significant”? Hale expresses a similar concern:

> To accept that [a notion of] necessity is not absolute is to acknowledge that while it is, say, necessary [in that sense] that heat is mean kinetic energy of molecules, there are possible worlds…in which this is not so. But what [one] wanted to maintain is that, given [that] heat is mean kinetic energy of molecules, there are no possible worlds in which heat is not so constituted [1996, 98].

In other words, if metaphysical necessity is not absolute, then there is an obvious sense in which it is not, after all, the final court of appeal for modal questions

Let us suppose, however, that the idea of a “uniquely metaphysically significant”, but non-absolute, notion of necessity could be made intelligible. On what grounds could one argue that metaphysical necessity, or some other metaphysically substantial notion of necessity, was so significant? I can think of three such grounds.

First, one could argue that metaphysical necessity (or some surrogate notion) is uniquely metaphysically significant because uniquely metaphysically significant notions like supervenience, essence, and constitution are defined in terms of it.[37] For example, supervenience is defined as follows. G-ness supervenes on H-ness just in case it is *metaphysically* impossible

[37] Alternatively: “the notion of metaphysical necessity figures into the best systemization (or explanation) of uniquely metaphysically significant phenomena”.

that there is a change in the distribution of G-ness absent a change in the distribution of H-ness. Similarly, on the traditional analysis of essence [Kripke 1980, 77], the essence of a thing, A, is defined as the set of properties A has in every metaphysically possible world where it exists.

But, first, stricter notions of necessity allow one to define everything that was definable in terms of less strict notions. For example, one can define the ordinary notion of supervenience in terms of N_1-necessity as follows. G-ness supervenes on H-ness just in case it is N_1-impossible that, given the mathematical truths, there is a change in the distribution of G-ness absent a change in the distribution of H-ness. Similarly, one can define the traditional notion of essence in terms of N_1-possible worlds in a similar way. A thing's traditional essence is the set of properties it has in every N_1-possible world in which the mathematical truths are the same. By contrast, one cannot define the stricter notions of N_1-supervenience or N_1-essence in terms of metaphysical necessity.

Second, corresponding to stricter notions of necessity *are stricter notions of essence, supervenience, and constitution*.[38] The idea that less strict notions of essence, supervenience, and constitution are uniquely metaphysically significant is just as unprincipled as the position to be argued. If anything, the opposite would seem to be true. For example, on the traditional analysis, being a member of {Socrates} is part of Socrates' essence, since he has it in every metaphysically possible worlds in which he exists. But it is not part of his essence modulo the N_1-possible worlds. If anything, this seems to favor the latter notion of essence, since, as Fine [1994, 4] notes, being a member of {Socrates} does not *seem* to be essential to Socrates.[39]

[38] Thanks to Greg Restall for discussion of this point.

[39] I do not intend here to suggest that one can avoid all such counterintuitive consequences by defining essence in terms of both metaphysically possible and impossible worlds. For a counterfactual analysis of essence in terms of both possible and impossible worlds, see Brogaard and Salerno [Forthcoming].

Another way that one might try to argue that a non-absolute notion of necessity is "uniquely metaphysically significant" is by arguing that only necessities corresponding to that notion are "grounded in the nature of things" – where X's nature is *what it is to be* X in Aristotle's sense.[40] For example, perhaps it is "grounded in the nature of set-hood" that every set is well-founded, even if it is possible in some real sense that some set fails to be. *Grounding* and *nature*, in the relevant sense, are hyperintensional notions on which we are supposed to have an independent grip. One problem with this argument is, thus, that it trades the challenge to show that there is a "uniquely metaphysically significant" notion of real necessity for the challenge to show that there are uniquely metaphysically significant notions of grounding and nature (much as the above proposal traded this for the challenge to show that there are uniquely metaphysically significant notions of supervenience, essence, in the traditional sense, and constitution.) Perhaps the latter challenge is much easier to meet. But this is far from obvious. Fine himself appears to hold that there are at least three notions of ground, all on a metaphysical par, just as there are at least three notions of necessity, all on a metaphysical par (Fine [2012]).

Even if there are "uniquely metaphysically significant" notions of grounding and nature, however, there is a more pressing problem with the present nature-based proposal. It does not seem to cover all the cases. It is metaphysically necessary that there are sets – and perhaps much else besides (not just that *if* there are sets, *then* they are, for example, well-founded). But, as Kment points out [2006, 267], there seems to be no way to explain this in terms of the nature of

[40] "Nature", in the present sense, is supposed to answer to our pretheoretical conception of essence. See, again, Fine [1994] who uses "essence" for what I am calling "nature", as well as Hale [2013] and Lowe [2012].

things alone.[41] It appears, then, that the proposal must be complicated. Metaphysical necessity is not "uniquely metaphysically significant" because it is grounded in the nature of things. It is so significant because it is grounded in the nature of things *and* in the mathematical – and perhaps still other – truths [Kment 2006, 273]. Even if the nature and mathematical and…truths form an "interesting natural class" [Kment 2006, 268], it is hard to see how that class could be uniquely metaphysically significant. Indeed, Kment seems to hold that there are other such classes, corresponding to other real notions of necessity. His view seems to be that metaphysical necessity is "uniquely significant" mainly in that metaphysical necessity reflects explanatory relationships that metaphysicians happen to find especially interesting.[42]

Peacocke [1997] suggests a final argument for the "unique metaphysical significance" of metaphysical necessity. Peacocke argues that metaphysical necessity corresponds to assignments of concepts to semantic values which respect the rules that govern their application in the actual world. To talk about a world in which some set contains itself, for example, would simply be to use "set" differently. But, first, it is hard to imagine a principled argument that the rules which govern the application of the concept of set in the actual world preclude sets' containing themselves – given what was argued in Section 3. Evidently, non-well-founded set theorists think they mean *set* by "set", and we seem to interpret them that way. Second, even if

---

[41] Assuming that things cannot have properties in worlds in which they do not exist, and that things cannot exist "of their very natures". Thanks to an anonymous referee for pressing me to make the second assumption explicit.

[42] Kment's view has changed somewhat since his [2006], although I believe analogous points still apply. See his [2014] Secs. 1.4, 6.2, and 7.1 and his [2015] Secs. 1.2 and 3. Kment [2006, Sec. 5] offers an elegant argument that the nature and mathematical truths form an "interesting natural class". But it makes two assumptions of which I am doubtful. First, it assumes a strong form of the thesis that mathematics is indispensable to empirical science, according to which mathematical theorems explain, in a metaphysical sense of "explain", empirical scientific facts, such as that an empirical generalization is a natural law [2006, 280]. Second, it assumes that any other truths that might need to be invoked in order to explain the necessity of metaphysically necessary existential truths (e.g., that there are universals) will be more explanatorily basic than any truths not in the class truths needed to explain this.

there were such an argument, it would just relocate the problem. Semantic values come cheaply for Peacocke. In addition to being a set, there is being a shmet, where shmets are just likes sets except that some shmets can contain themselves. Similarly, in addition to being water, there is being shwater, where shwater is just like water except that shwater can fail to be composed of H_20. For paradigmatic metaphysical impossibilities, P, one can “translate” the claim, <>P, into a claim, <>Q, that Peacocke accepts, where Q inherits the “metaphysical content” of P. For example, “it is possible that some set contains itself” becomes “it is possible that some shmet contains itself”. Similarly, “it is possible that water fails to be composed of H_20” becomes “it is possible that shwater fails to be composed to H_20”. Of course, this translation does not preserve the literal meaning of the proposition, since it does not even preserve its reference. What the translation preserves is the philosophical problem – or something much like it. Where one might have worried that there is nothing “uniquely metaphysically significant” about the sense in which it is impossible that a set contains itself, or about the sense in which water could not have failed to be composed of H_20, one should now worry that there is nothing “uniquely metaphysically significant” about sets as opposed to shmets, or water as opposed to shwater.[43]

Actually, the last problem seems to arise for the second, nature-based, proposal as well. The believer in natures typically holds that they are plenitudinous.[44] In addition to the nature of sets, there is, apparently, the nature of shmets, and in addition to the nature of water, there is that of shwater. Accordingly, the question rearises: what is uniquely metaphysically significant about

[43] See Sidelle [1989, 235] and Unger [2014] for related discussion. One might also argue that if “serious actualism” (in the sense of Plantinga [1982]) is false, then a world with only shmets need not violate standard set theory. (Thanks to an anonymous referee to pointing this out.) However, this would not by itself address the problem with Peacocke’s view. There would still be a “witness” for the claim “some set fails to be well-founded” in such a world, whether or not it was a set *per se*.
[44] See, e.g., Hale [2013, Ch. 1] and Lowe [2012, 935].

sets versus shmets, water versus shwater, and so on? Absent a satisfactory answer to this question, there seems to be little practical difference between the view that there is no uniquely metaphysically significant notion of necessity and the view that there is, but its necessities are "grounded in the nature of things".

To sum up: even assuming that it makes sense to say that some metaphysically substantial notion of necessity is "uniquely metaphysically significant", albeit not absolute (something that is certainly questionable), there seems to be little reason to believe that there is such a notion. Moreover, even if there were, the problem of specifying one would just seem to get displaced.

Note that it would not have helped in Section 2 to add as *epistemic grounds* for judging that <>P that P is not precluded by the nature of anything plus the mathematical truths plus…, or that there is an assignment of P's concepts to semantic values which respects the rules that govern their application in the actual world.[45] It would remain to show, for example, that the class of nature truths plus mathematical truths plus… is "uniquely metaphysically significant" – as compared with, e.g., *just* the nature truths, or just the logical ones. Without such an argument, a modal epistemology based on such judgments would be no more principled than a modal epistemology based on "conceivability", where "conceivable" means L-consistent with truths, T.

7. Modal Metaphysics Misconceived?

I have argued that there is no principled reason to believe that metaphysical necessity, or any other metaphysically substantial notion of necessity, is absolute, or to regard a non-absolute

[45] See Lowe [2012] for the apparent suggestion that <>P is not only (metaphysically) grounded in the nature of things, but our (epistemic) ground for judging that <>P is that it is not precluded by the nature of anything.

notion of necessity as otherwise "uniquely metaphysically significant" – whatever exactly that might mean. The argument assumed that the grounds on which we judge that paradigmatic metaphysical possibilities are possible in some real sense (surveyed in Section 2) are good, an assumption that one could conceivably deny. Perhaps we have been trying to determine what is possible in the wrong way. Alternatively, one could insist that a metaphysically substantial notion of necessity is uniquely metaphysically significant, even though there is no principled argument for this conclusion. Metaphysics is one thing, and epistemology is another, after all.

But such positions are unstable. Absent an alternative modal epistemology, the first position threatens to engender modal skepticism.[46] The second position is the paragon of dogmatism. Its advocate is like the Euclidean geometer, who, when introduced to hyperbolic geometry, insists that his own is uniquely metaphysically significant (as a pure mathematical theory), though he cannot say why. He can only plead that Euclidean points and lines are central to his geometrical thought. I will assume that we wish to avoid such a posture. If so, then no metaphysically substantial notion of necessity is absolute, or otherwise "uniquely metaphysically significant".

Let us discuss the deflationary ramifications of this conclusion. Consider, again, the question of whether the mathematical truths are necessary. Platonists argue that they are, while (Fieldian) nominalists argue that they are not.[47] Given the above, what of metaphysical import, *besides the*

[46] See Edgington [2004] for an apparent example of the first position. Edgington seems to hold that metaphysical possibility is absolute, but dramatically less inclusive than is commonly believed (see also Wilson [2013] for a related view). However, I believe her "empiricist" modal epistemology actually smuggles in non-empirical knowledge of a more inclusive modality for essentially the reasons described in Williamson [2016, 462]. For an example of something like the first position which embraces modal skepticism, see van Inwagen [1997].
[47] Fieldian nominalists hold that (existentially quantified) mathematical sentences are literally false. For discussions of whether the mathematical truths are necessary (whatever they are), see, e.g., Balaguer [1998], Field [1993], and Wright [1988]. (Balaguer and Field argue that mathematical truths are not necessary "in any important sense".)

actual truth of standard mathematics, might be at stake in this debate? The obvious thing is whether the mathematical truths are absolute. Is there any possible world in which they are different? But, given what was argued in Section 5, this cannot be what is at stake. The mathematical truths are obviously not absolute. For example, they are not N_1-necessary. Another thing that might be at stake is whether the mathematical truths are necessary relative to the uniquely metaphysically significant, albeit non-absolute, notion of necessity. But, given what was argued in Section 6, this cannot be what is at stake either. There is no such notion. A final thing that might be at stake is whether the mathematical truths are necessary relative to a non-uniquely metaphysically significant notion of necessity. However, if there are such notions of necessity at all, then the answer again seems straightforward. Of course they are. For example, they are physically necessary, and physical necessity would presumably be (non-uniquely) metaphysically significant.[48]

Is there some *other* question of metaphysical import that might be at stake? It is hard to see what it could be. Given a determinate use of "necessary" there may be a mind-and-language independent answer to the question of whether the mathematical truths are necessary. If the meaning of "necessary" is sufficiently opaque, that answer may even be unobvious. But in light of what has been argued, all we seem to learn in answering that question is what we quantify over with "necessary" (assuming a worlds-based semantics). We know that there are possible worlds in which the mathematical truths are the same, and possible worlds in which they are

[48] Perhaps what is at stake is whether the sense in which the mathematical truths are necessary is "more significant than" any sense in which they are not, even if not uniquely so? If this question makes sense, then the answer again seems obvious: they are not. If anything, [N_k] more metaphysically significant than [N_j] when [Nk] is more absolute than [N_j] for reasons discussed in Section 5.

different. We also know that the former class of worlds is not "uniquely metaphysically significant". There is no apparent metaphysical (as opposed to semantic) question left to dispute.

It might be thought that this just shows that the debate about the necessity of mathematics is misconceived. But the point appears to generalize wildly. Take nearly any alleged necessity of traditional metaphysical interest, such as those listed in sections 2 and 3. In light of what has been argued, there is a real sense of "necessary" in which each fails to be necessary, even assuming that there is another in which it does not. Moreover, the sense in which each is necessary is not uniquely metaphysically significant. For example, assuming that utilitarianism is actually true, there is a sense of "[]" in which [](utilitarianism is true), a sense of "[]" in which ~[](utilitarianism is true), and the former sense is not uniquely metaphysically significant. Similarly, for the claim that there are universals, or that the grounding relation is well-founded.

The point applies, in particular, to Kripkean identities, such as that Hesperus = Phosphorus. While *textbook* disagreement over the necessity of such claims may turn on the actual identity of Hesperus, disagreement over the Necessity of Identity cannot be dismissed in this way. The contingent identity theorist holds that even if Hesperus = Phosphorus, there is a (perhaps extremely distant) possible world in which Hesperus ≠ Phosphorus.[49] But if the Necessity of Identity fails for some real notion of necessity (even if it holds for metaphysical necessity), then influential debates seem misconceived. Consider, for instance, the conceivability argument for mind-body dualism (Chalmers [2002], Yablo [1993]). This proceeds from the premise that it is conceivable that the mind exists without the body (or vice versa) to the real possibility of this.

[49] See, again, Wilson [1983] for the view that identity is contingent.

By the Necessity of Identity, $VxVy[(x = y \rightarrow [](x = y)]$, the mind and body are thus distinct. The key question surrounding this argument is widely supposed to be whether “conceivability is a guide to possibility”. But *even if conceivability is a guide to possibility*, the argument fails. It assumes that the Necessity of Identity holds for every real notion of necessity. If it does not, then the worlds in which the mind is not identical to the body may lie outside the class of worlds for which it holds.

The deflationary ramifications of the above carry over to debates about other modally saturated phenomena, like supervenience. Consider the supervenience of the normative on the descriptive. In typical cases of supervenience, a specification of the distribution of supervenient properties seems to follow as a matter of conceptual necessity (in a rather expansive sense of “conceptual necessity”) from a specification of the distribution of subvenient ones. For instance, a specification of the distribution of *being a chair* seems to follow as a matter of conceptual necessity from a specification of the distribution of microscopic properties. By contrast, a specification of the distribution of normative properties does not seem to follow as a matter of conceptual necessity from a specification of the distribution of descriptive ones. This is the force of Moore’s Open Question Argument (Moore [1903, Sec. 13]). So, does the normative supervene on the descriptive? The answer is that it does relative to a notion of necessity which counts appropriate “bridge laws” as necessary, and it does not relative to one which does not. There is no deeper answer. In particular, the normative does not supervene on the descriptive relative to a notion of necessity that only counts “conceptual” bridge laws as necessary. However, relative to a notion of necessity which fails to preclude mereological nihilism, not even the macroscopic descriptive properties supervene on microscopic descriptive properties.

It does not follow that counterfactual questions get similarly "deflated", however. Even if typical questions of modal metaphysics are highly modality-relative, it could be that counterfactuals are "absolute", in a sense. It could be that if a counterfactual is true with respect to the N-possible worlds, then it remains true with respect to the N+-possible worlds, whenever [N+] is more absolute than [N]. More exactly, consider the following:

> Suppose that [N+] is more absolute than [N]. Then, if (A []→B) is true with respect to a model, N = <D, S, V, @>, where w ∈ D just in case w is N-possible, then (A []→B) remains true with respect to a model, N+ = <D', S', V', @> where w ∈ D' just in case w is N+-possible, whenever N is a submodel of N+.[50]

This principle is false. Let (A []→B) be the counterfactual that *had the laws of physics been different, then snow would have been both white and not white*, let [N] be physical necessity and let [N+] metaphysical necessity. Then Counterfactual Absoluteness implies, falsely, that *had, as a matter of metaphysical possibility, the laws of physics been different, then snow would have been both white and not white*. The apparent problem with the principle is that it does not require that (A []→B) be *non-vacuously* true in N. In other words, it does not require that A has a witness in some N-possible world. The intuition behind the principle is better formulated:

> *Counterfactual Absoluteness*: Suppose that [N+] is more absolute than [N]. Then, if (A []→B) is non-vacuously true with respect to a model, N = <D, S, V, @>, where w ∈ D

[50] N and N+ are models of propositional conditional logic, where S is a class of relations, one for each formula of the language, D is a domain, V is a valuation, and @ is the actual world.

just in case w is N-possible, then (A []→B) remains true with respect to a model, N+ = <D’, S’, V’, @> where w ∈ D’ just in case w is N+-possible, whenever N is a submodel of N+.

Counterfactual Absoluteness says that once one finds a witness for the antecedent of a true counterfactual in some N-possible world, one cannot flip its truth-value by ascending to a more absolute modality, N+. But even this is unobvious. It implies a relativized version of the *Strangeness of Impossibility Condition*, according to which any possible world is closer to the actual world than any “impossible” world [Nolan 1997, 550]. In other words, it assumes that the set of closest A-and-B worlds will never be a subset of (D’-D). To illustrate, let (A []→B) be the counterfactual *had the laws of physics been different*, *then the laws of mathematics would not have been different*. Since this is true when evaluated with respect to the metaphysically possible worlds, letting [N] be metaphysical necessity, and [N+] be N_1-necessity (mentioned in Section 5), Counterfactual Absoluteness implies that (A []→B) remains true when evaluated with respect to the N_1-possible worlds (where the laws of mathematics can be different). However, it is far from obvious that the closest world in which the laws of physics are *very* different is a world with the same mathematical laws – or, indeed, even a world with the same logical laws

Or consider a more mundane case. Let [N] be metaphysical necessity, let [N+] be metaphysical necessity-minus-the-origin-truths, and let A be the proposition that Obama is named “Alice”, and let B be the proposition that Obama is not female. Then the counterfactual (A []→ B), *had Obama been named “Alice”, then Obama would not have been female*, is true with respect to the N-possible worlds, since the closest metaphysically possible worlds where Obama is named

"Alice" are still worlds where Obama is male. Nevertheless, it is at least arguable that (A []→ B) is false with respect to the N+-possible worlds, since some of the closest worlds where Obama is named "Alice" are in (D'-D). They are arguably worlds where Obama is female.[51]

To sum up: if the preceding arguments are compelling, then traditional modal questions seem to be misconceived. They receive different answers under different interpretations of the modal vocabulary, and no metaphysically substantial such interpretation is "uniquely metaphysically significant". This conclusion is broadly harmonious with that of Cameron [2009] and Sider [2011, Ch. 12], but the arguments are very different. Cameron's argument requires that modal operators are quantifiers over Lewis's "ersatz worlds". Evidently, if modal operators are quantifiers over worlds, and worlds are, e.g., sets of sentences, then modal questions are misconceived. What is the point of calling some sets of sentences "possible"? They are all there, equally real – consistent and inconsistent alike [Cameron 2009, 15].[52] Similarly, Sider's argument turns on an alleged reduction of modality, and on the availability of a non-modal analysis of logical consequence. The present argument does not depend on any such assumptions. The above conclusion is also in the spirit of that of Sidelle [1989] and Unger

---

[51] Thanks to Alex Silk for suggesting an example similar to this one. (The point does not depend on Lewis's contention that if P is a physically possible proposition about a matter of particular fact, then some (physically impossible) miracle occurs at the closest P-worlds [Lewis [1979]. This contention might be deflected on two grounds. First, it could be argued that the closest P-worlds do not violate the actual laws of physics – they might be "exploding difference worlds" as in Bennet [2003], say. Second, it might be argued that a world, w, can fail to conform to a law, L, even though L is a law of w (Kment [2014: 7.1, 8.5–8.7]). Thanks to an anonymous referee for illumination on this point.)

[52] I do not suggest that Cameron would be happy with this way of stating the upshot of his paper. See fn. 24. (In fact, anyone who believes in "impossible worlds", and regards them as being of an ontological kind with possible worlds – even if they are "genuine worlds" in the sense of Lewis – seems to me to be committed to a similar kind of deflationism about modal questions. As far as I know, however, this has not been explored in the literature. What is the non-verbal issue as to whether some world is "possible" from the standpoint of such an impossible worlds theorist? Indeed, what is the non-verbal difference between Mortensen's "possibilism" (to be discussed in the next section), which virtually no one accepts, and views like Nolan [1997], according to which every set of sentences corresponds to a world, and all worlds are on a metaphysical par, which many accept?)

[2014]. However, unlike theirs, the above argument also has relevance to apparently *a priori* necessities, and does not appeal to any notion of analyticity.[53] The present argument depends on the following simple observation: the *grounds that we actually advance* for judging that paradigmatic metaphysical possibilities are possible seem to serve equally to show that all manner of paradigmatic metaphysical impossibilities are too, and there seems to be no principled reason to regard a non-absolute notion of necessity as "uniquely metaphysically significant".

8. Indefinite Extensibility

I have argued that no metaphysically substantial notion of necessity is uniquely metaphysically significant, and, therefore, that traditional modal questions are misconceived. But this conclusion leaves a key question unanswered. Does the list N_1, N_2, N_3,… (given in Section 5) terminate? *Is* there an absolute notion of necessity (even if it is not metaphysically substantial)?

The *trivial modality*, [T], of Mortensen [1989], would be (vacuously) absolute if it were real. According to it, <T>P, for all P, and [T]P for no P – i.e., everything is possible and nothing is necessary. Of course, vindicating the absoluteness of [T] would do nothing to vindicate the search for necessities. If [T] were absolute, then, again, nothing of traditional metaphysical interest would be necessary in every real sense, because nothing *at all* would be necessary in every real sense. If we could assume the S5 axiom, then this view would quickly reduce to absurdity (where we assume that P is possible and that [T]<T>P is not necessary).

1. <T>P (assume for *reductio*)

[53] Nor, unlike Sidelle, am I committed to the mind-and-language dependence of modal truths.

2. ~[T]<T>P (assume for *reductio*)

3. <T>P □ [T]<T>P (S5 axiom)

4. ~<T>P (from 2, 3, by Modus Tollens) [54]

However, part of Mortensen's position is that we cannot assume the S5 axiom.[55] But, while not absurd, [T] does not seem to have much claim to being a real notion of necessity. In *this* case the grounds that we actually advance for judging that <>P do not seem to be satisfied. Let P = For every Q, True(Q). Then, in particular, <T>(For every Q, True(Q)) – i.e., possibly, everything is the case (even that it is not possible that everything is the case!).[56] If the notion of conceivability has any content (a question which I regard as open), then we cannot conceive of a situation in which literally everything is the case.[57] More strongly, if inconceivability is a guide to impossibility, then it is not just that we do not have good reason to believe that it is possible in

---

[54] The view that anything is possible simpliciter is inconsistent assuming the duality of [] and <>, in tandem with the S5 axiom, as follows.

1. <T>P (assume for *reductio*)

2. <T>[T]~P (assume for *reductio*)

3. <T> ←→ ~[T]~P (duality)

4. <T>P → [T]<T>P (S5 axiom)

5. ~[T]~[T]~P (from 2, 3)

6. ~[T]<T>P (from 3, 5)

7. ~<T>P (from 4, 6, by Modus Tollens)

[55] Mortensen has kindly confirmed this for me in personal correspondence.

[56] If, unlike Mortensen, one does not accept the meaningfulness of self-referential sentences, then one can choose any other sentence that one regards as expressing an inconceivable proposition.

[57] Mortensen's argument that "anything is possible" seems to me to confuse fallibility and real possibility. He argues that all of our beliefs are fallible, and infers from this that anything is possible. Again, I believe that the view that there is no principled distinction between "merely epistemic" possibility and real possibility is defensible. But there is no plausibility to the view that mere fallibility collapses into real possibility. For an argument that anything is conceivable (not just that all of our beliefs are fallible), see Priest [2016, Sec. 4].

some real sense that everything is the case. We have reason to believe the opposite – and, hence, have reason to believe that [T] is not a real notion of necessity.

Suppose, then, that $[N_K]$ is absolute, but non-trivial – i.e., there is a P with $[N_K]$P. Perhaps $[N_K]$ is L-necessity for some logic, L, for example.[58] If such a notion of necessity were absolute, then the methodological upshot of the above might be that metaphysicians should turn their attention to the N_K-necessities. But it is hard to see how such a notion of necessity could be absolute.

Consider all P such that $[N_K]$P. Let Q_P = *P fails to have a designated value*. Then, for typical such P, the following seems false. Had it been the case that Q_P, it would have been the case that P.[59] For instance, it seems false that had it been the case that (Either the Twin Primes Conjecture is true, or it is not the case that that conjecture is true) failed to have a designated value, then it would have had a designated value. That is, the second ground for judging that $<>Q_P$ canvassed in Section 2 seems to be satisfied. But so does the first. Given any set of "laws", we seem always to be able to conceive of them weakened somehow. By weakening the classical validities we conceive of intuitionistic possibilities, and by weakening the intuitionistic validities we conceive of substructural possibilities. The process has no apparent stopping point. Finally, our judgment that $<>Q_P$ does not seem to be vulnerable to standard modal defeaters. As with $<>(V\neq U\alpha(V\alpha))$, our judgment that $<>Q_P$ need not turn on outstanding logical or empirical conjectures. In other words, the third ground for judging that $<>Q_P$ appears to be satisfied too.[60]

---

[58] I identify a logic with its set of validities in this section.
[59] See Brogaard and Salerno [2013, 651] for a similar point. (I speak of designated values, rather than truth or falsity *per se*, so as not to prejudge what values the weakest logic giving rise to a real modality might take.)
[60] The problems with trying to block the arguments of Section 2 or Section 3 by appeal to, say, essence, as discussed in Section 6, arise equally in the present context.

If this is correct, then there is no absolute notion of possibility (or necessity). More exactly, the notion of absolute possibility is *indefinitely extensible*, in the sense of Dummett [1993].[61] "[I]f we can form a definite conception of a totality all of whose members fall under the concept [of absolute possibility], we can, by reference to that totality, characterize a larger totality all of whose members fall under it [1993, 441]." While we may be able to identify absolute *propositions* (e.g., "It is not the case that, for every Q, True(Q)"), we are precluded from collecting them all. Any alleged such collection includes too little or too much. Whenever we successfully lasso only possible worlds, we realize that we could always have included more. In this sense, trying to collect all possibilities is like trying to collect all sets. Contra Wittgenstein [2014, Sec. 4], we seem to be unable to *draw the line* of intelligibility.[62]

It might be objected that L-necessity *for the correct logic L* must be absolute (assuming that logical necessity is a real notion of necessity). If it is possible in some real sense that an L-validity fails to have a designated value, then L is not the correct logic after all. It is simply constitutive of the correct logic that it safeguards against all real possibility of error.[63]

This argument assumes that there is a correct logic, an assumption which is suspect in the present context. But even if there is, the argument is unpersuasive. First, the view that the correct logic

[61] For the related idea that "there is no sharp line between restricted and unrestricted metaphysical necessity", see Sider [2012, 282].

[62] There are differences between the sense in which the notion of set is indefinitely extensible and the sense in which the notion of absolute possibility seems to be. For a discussion of different notions of indefinite extensibility, see Shapiro and Wright [2006]. (Let me highlight that the present suggestion allows that there are absolute *propositions*, like boring validities. The claim is that one cannot "put them all together" to get an absolute notion of possibility. Either one will end up with a non-absolute, albeit real notion of possibility, or one will end up with a notion of possibility that is not real.)

[63] See McFedridge [1990] for a related line of thought.

must guard against all real possibility of error, as opposed to guarding against all L-possibility of error, is unprincipled. No logic can guard against all possibility whatever of error. There is a sense of "could" in which any proposition could fail to have a designated value. But if there is, then it is hard to see why there should not be a real, albeit extremely inclusive, sense of "could" in which an L-validity failed to. Second, even if the correct logic must guard against all real possibility of error, this just shows that the notion absolute consistency is itself indefinitely extensible. It shows that, given an absolutely consistent set of sentences, we can always find a more inclusive one. If this is so, then the notion of a correct logic is indeterminate.[64]

9. Objectivity

If the notion of absolute possibility is indefinitely extensible, then the problem with modal metaphysics has precedent. It is analogous to the problem with the "search for new axioms" to settle the Continuum Hypothesis (CH), from the standpoint of the set-theoretic pluralist.[65] According to the set-theoretic pluralist, there are myriad notions of set, and all are equally satisfied (under a face-value Tarskian satisfaction relation).[66] Moreover, there is no absolute notion of set with respect to which all others are mere restrictions. CH is true relative to some notions of set, false relative to others, and none is "uniquely metaphysically significant". The question of whether the CH is true simpliciter is like the question of whether the Parallel Postulate is true simpliciter – understood as a pure mathematical conjecture, rather than as a

[64] See the Appendix for discussion of a related formal argument.

[65] See Balaguer [1997], Field [1998], Hamkins [2012], and Linsky and Zalta [1995], for formulations of set-theoretic pluralism.

[66] The Completeness Theorem (which is itself a theorem of standard set theory) ensures that any consistent notion of set is satisfied on *some* satisfaction relation or another. Field [1997] correctly emphasizes this distinction.

hypothesis about physical spacetime. The Parallel Postulate is true of Euclidean space, false of, e.g., hyperbolic space, and that is all there is to it. As Hamkins writes,

> There is a…strong analogy between the [pluralist] view in set theory and the most commonly held views about…geometry….Today, geometers have a deep understanding of the alternative geometries, which are regarded as fully real and geometrical. The situation with set theory is the same. The initial concept of set put forth by Cantor and developed in the early days of set theory seemed to be about a unique concept of set, with set-theoretic arguments…seeming to take place in a unique background set-theoretic universe….[T]oday set theory is saturated with [alternative universes]….[T]he [pluralist] view now makes the same step in set theory that geometers ultimately made long ago, namely, to accept the alternative worlds as fully real [2012, 426].

If set-theoretic pluralism is true, then even if the question of whether CH is true has a mind-and-language independent answer in a context (because that context fixes the extension of predicate "∈"), the search for that answer, as traditionally understood, seems to be misconceived. All we learn in answering it is what universes of set we are talking about. We know that CH is true in some part of the pluriverse, false in some part of it, and neither is uniquely metaphysically significant. In this sense, the question of whether CH is true has no objective answer.[67]

[67] See Hamkins [2015]. (It might be wondered how the possibility of the set-theoretic truths being different interacts with the assumption of set-theoretic pluralism. The answer is that, if the arguments from Section 3 are sound, pluralism is just another absolutely contingent mathematical truth. Even if pluralism is true, it could have been false. Godel [1947] could have been right, and there could have been "one true" V in which CH was true or false.)

I suggest that paradigmatic modal questions are also like the Parallel Postulate question. On this view, questions like "is it necessary that water is composed of H_20?" are not misconceived because (following Mortensen [1989]) their objective answer is always "no". Nor are they misconceived because they lack a mind-and-language independent answer. They are misconceived because they lack an objective answer. There are myriad notions of necessity – physical, metaphysical, N*, N_3, classical, intuitionistic – all having equal claim to being "real", and each affords its own answers to paradigmatic modal questions. Some of these may be more interesting for some purposes. But none constitutes "the ultimate court of appeals" for modal questions. None is absolute or otherwise uniquely metaphysically significant.[68]

This is, of course, not to deny that the notion of metaphysical necessity (or some similar notion) has played a uniquely significant role in our metaphysical theorizing. Metaphysical necessity has been central to modal discussions for decades. But if metaphysical necessity is not absolute or otherwise uniquely metaphysically significant, then this has more to do with our training than with the world. After all, select notions of set have played a uniquely significant role in set theorists' theorizing as well. But once it is acknowledged that there are other notions of set that have equal claim to being satisfied, it becomes clear that there is nothing uniquely *metaphysically* significant about, say, the well-founded notion of set. As Martin puts it, "[f]or individual mathematicians, acceptance of an axiom [like the Axiom of Foundation] is probably often the result of nothing more than knowing that it is a standard axiom [1998, 218]."

[68] It might be thought that we should at least hold that if a *sentence*, P, is possible in some real sense then *it* is "objectively" possible, since it can never be turned impossible by ascending to a more absolute modality. But if that argument worked, then, by parallel reasoning, the logical pluralist is likewise committed to holding that it is objectively the case that pretty much nothing is valid (see Beall and Restall [2006, 92]). A similar argument would seem to work in the set-theoretic case.

Similarly, our acceptance of a given metaphysical necessity as a necessity is probably the result of little more than being told "that logic…is…necessary….that laws of nature are not….that it is…necessary that "nothing can be in two places at once", and so on [Sider 2011, 266]."

Finally, this is not to deny that metaphysically substantial notions like metaphysical necessity may be *non-uniquely* metaphysically significant (assuming that it makes sense to say that a non-absolute notion of necessity is metaphysically significant). Just as one might hold that select notions of set are metaphysically significant, even if not uniquely so, one might hold that select notions of necessity are.[69] But determining what is "packed into" various metaphysically significant notions of necessity is quite different from the traditional project of determining what is necessary simpliciter. Just as the set-theoretic pluralist has ceased searching for the size of the continuum simpliciter, retreating to qualified conclusions such as that the continuum has size Aleph_1 *in the constructible sets* (in Godel's sense), the modal metaphysician, under the present characterization, has ceased searching for the necessities simpliciter, retreating to qualified conclusions such as that [](Hesperus = Phosphorus) *in the metaphysically possible worlds*. There is no pretension that the constructible sets or metaphysically possible worlds exhaust the sets or worlds, respectively, or that they are otherwise "uniquely metaphysically significant" among their kind. "Hesperus = Phosphorus" is true in all metaphysically possible worlds, not true in some logically possible worlds, and that is all there is to say about it.

To sum up: if the notion of absolute possibility is indefinitely extensible, then there is no absolute or otherwise uniquely metaphysically significant notion of possibility. There are many

---

[69] Again, this appears to be Fine's position in his [2002] and Kment's position in his [2006] and [2014, 33 and Sec. 5.3]. Their "pluralism" is much less much radical than the one that I advocate here, however.

real notions of necessity, not even totally ordered by relative absoluteness, each affording its own answers to modal questions. In this sense, there is no objective fact as to how the world could have been. There is no objective boundary between possibility and impossibility.

10. Conclusion

If the arguments offered here are compelling, then one can agree that modal metaphysics is intelligible, and even that there are mind-and-language independent modal facts, while thinking that Quine was right – modal metaphysics is misconceived. This conclusion does not depend on the positive picture advanced in sections 8 and 9, according to which modal questions are not objective. As long as one agrees that nothing of traditional metaphysical interest is necessary in every real sense of "necessary", and that no restricted notion of necessity is "uniquely metaphysically significant", traditional modal questions seem to lose their force. However, the advocate of a very inclusive absolute notion of possibility does inherit a challenge: draw the line of absolute possibility in a way that is not vulnerable to an indefinite extensibility argument.

The philosopher who maintains that some metaphysically substantial notion of possibility is absolute, or otherwise uniquely metaphysically significant, is in a more difficult dialectical situation. He is obliged to give a principled argument that the alternative notions of possibility discussed in this article are "merely epistemic" or are otherwise "less metaphysically significant" than metaphysical possibility. He is also obliged to produce a new method for discovering modal truths, or to explain in a non-question-begging way how traditional methods were misapplied in Sections 3 and 4. Again, it would not do to declare that *by definition* alternative mathematics is inconceivable, for example.

What of the "modal pluralist", who holds that there is no objective boundary between possibility and impossibility? She must decide how far her pluralism extends. Modal pluralism might be thought to complement (even if not engender) logical pluralism. There are various notions of consequence corresponding to various real notions of necessity, and none is uniquely metaphysically significant. In particular, none is strictest.[70] If one also accepts the standard formulation of set-theoretic pluralism, according to which *all* consistent set theories are true (under a face-value Taraskian truth-definition), albeit true of different structures,[71] then a radical conception of the set-theoretic pluriverse emerges: *for every notion of consistency*, every consistent set theory is true ("of" some part of the pluriverse). Of course, if the concept of absolute consistency is indefinitely extensible, then one cannot "collect" all such notions.[72]

If mathematics, logic, and modality each invite a pluralist treatment, then one might be tempted to be a pluralist about the *a priori* (or apparent *a priori*) quite generally. Such a view would resemble Carnap [1958] methodologically, but would drop the baggage of frameworks and analyticity. Of course, Carnap held that normative questions were non-cognitive, and one might wish to be a pluralist about them too. But normative inquiry would retain a peculiar place in the context of a general pluralism. While knowledge that ZF + CH and ZF + ~CH are both true (of different structures) "deflates" the question of whether CH, knowledge that utilitarianism and deontology are both true ("of" different properties) would not seem to deflate the question of

[70] Such a formulation of logical pluralism is similar to that of [Beall and Restall, 2006] although I am not sure whether they would accept the indefinite extensibility component. However, they do write: "we see no place to *stop* the process of generalisation and broadening of [the generic notion of 'case']" [2006, 92, italics in original].
[71] There are technical problems with this formulation, despite being standard. See Clarke-Doane [Manuscript], Field [1998], and Koellner [2009].
[72] Evidently, it cannot be part of every notion of "consistency", in the relevant sense, that a consistent set of sentences does not imply a contradiction, if paraconsistent "notions of consistency" are to count.

whether to lie when utility would be maximized. Normative inquiry seems immune to deflation in a way that non-normative inquiry does not. My own view is that this shows that normative inquiry is concerned with more than truth ([2015b]). But I cannot defend this assessment here.

Appendix: The Hale-McFedridge Argument

There is an argument, due to Hale [1996, 96—97], drawing on McFetridge [1990], which could be used to show that a fragment of intuitionistic-logical necessity is absolute.[73] Let [] and <> represent any non-epistemic notion of necessity and possibility, respectively, and let [*] and <*> represent logical necessity and possibility, respectively. Then five assumptions are made.

a) If [*](A→B) then [*][(A&C)→B]
b) [*](A→A)
c) If [*](A→B) and [*](A→C) then [*][A→(B&C)]
d) If <>A and [*](A→B) then <>B
e) ~<>(A&~A)

The Hale-McFetridge Argument then proceeds:

1. [*](A→B) (assume for *reductio*)
2. <>(A&~B) (assume for *reductio*)
3. [*][(A&~B)→B] (from 1, by (a))
4. [*](~B→~B) (by (b))

[73] For related arguments, see Leech [2015] and Rumfitt [2015, Part 1]. See also Leech and Hale [Forthcoming].

5. [*][(A&~B)→~B] (from (4) by (a))
6. [*][(A&~B)→(B&~B)] (from 3, 5 by (c))
7. <>(B&~B) (from 2 and 6, by (d))
8. ~<>(B&~B) (by (e))
9. ~<>(A&~B) (2,7,8 *reductio*)

What is wrong with this argument? (d) and (e) are both unconvincing. With respect to (e), Hale claims that "there is no reasonable sense of 'possible' in which it is possible for a contradiction to be true [Hale 1996, 97]." But, for present purposes, a sense of 'possible' is reasonable if the grounds that we advance for claiming that paradigmatic metaphysical possibilities are possible serve equally to show that possibilities in that sense are possible. In this case, they do seem to. For example, it seems non-vacuously true that had it been for some, P, that (P &~P), and had Priest's Logic of Paradox been correct, not every sentence would have been true.

With respect to (d), Hale claims "it is hard to see how we could reason about <>-possibilities without employing (d). If the logical consequences of <>-possibilities need not…be <>-possible… we would…be deprived of any…way to test…claims about <>-possibility [2013, 108]." But to deny (d) is not to deny that for every kind of possibility, <>, there is a logic that one can use to reliably reason about <>-possibilities. It is to deny that there is a *single* logic which allows one to reliability reason about possibilities of *every* kind. Hale offers no reason to suppose that there must be such a logic.

Bibliography

Balaguer, Mark. [1998] *Platonism and Anti-Platonism in Mathematics*. New York: Oxford.

Beall, JC and Greg Restall. [2006] *Logical Pluralism*, Oxford: Oxford University Press.

Bealer, George. [2002] “Modal Epistemology and the Rationalist Renaissance”, in in Tamar Gendler and John Hawthorne (eds.), *Conceivability and Possibility*. New York: Oxford University Press. 71–125.

Bennett, Jonathan. [2003] *A Philosophical Guide to Conditionals*. Oxford: Clarendon Press.

Brogaard, Berit and Joseph Salerno. [2013] “Remarks on Counterpossibles.” *Synthese*. Vol. 190. 639—660.

-----. [Forthcoming] “A Counterfactual Account of Essencne.” *The Reasoner*.

Cameron, Ross. [2009] “What’s Metaphysical About Metaphysical Necessity?” *Philosophy and Phenomenological Research.* Vol. 79. 1—16.

Carnap, Rudolph. [1958] *Empiricism, Semantics and Ontology*, 2nd edition, Chicago: The University of Chicago Press, 205–221.

Chalmers, David. [2002] “Does Conceivability Entail Possibility?” in Tamar Gendler and John Hawthorne (eds.), *Conceivability and Possibility*. New York: Oxford University Press. 145-200.

Clarke-Doane, Justin. [2014] “Moral Epistemology: The Mathematics Analogy.” *Noûs*. Vol. 48. 238-255.

-----. [2015a] "Justification and Explanation in Mathematics and Morality," Russ Shafer-Landau (ed.), *Oxford Studies in Metaethics, Vol. 10*. New York: Oxford University Press.

-----. [2015b] "Objectivity in Ethics and Mathematics," Ben Colburn (ed.), *Proceedings of the Aristotelian Society, The Virtual Issue, No. 3 (Methods in Ethics)*.

-----. [2016] "Debunking and Dispensability," Neil Sinclair and Uri Leibowitz (eds.), *Explanation in Ethics and Mathematics: Debunking and Dispensability*. Oxford: Oxford University Press.

-----. [Mauscript] “Set-theoretic Pluralism and the Benacerraf Problem.”

Cottingham, John, Robert Stoothoff, and Dugland Murdoch (trans.). [1988] *The Philosophical Writings of Descartes*, *Volume 2*. Cambridge: Cambridge University Press.

Conee, Earl and Richard Feldman. [1985] “Evidentialism.” *Philosophical Studies*. Vol. 48. 15-34.

DeRose, Keith. [2000] “Ought We to Follow Our Evidence?” *Philosophy and Phenomenological Research*. Vol. 60. 697-706.

DeRosset, Luis. [2014] “Possible Worlds for Modal Primitivists.” *Journal of Philosophical Logic*. Vol. 43. 109–131.

Dorr, Cian. [2008] “There are No Abstract Objects.” in Theodore Sider, John Hawthorne & Dean W. Zimmerman (eds.), *Contemporary Debates in Metaphysics*. New York: Blackwell.

-----. [2016] “Against Counterfactual Miracles,” *Philosophical Review* 125: 241-86.

Dummett, Michael. [1993] *The Seas of Language*. Oxford: Oxford University Press.

Edgington, Dorothy. [2004] “Two Kinds of Possibility.” *Aristotelian Society Supplementary Volume*. Vol. 78. 1 – 22.

Field, Hartry. [1989] *Realism, Mathematics, and Modality*. Oxford: Blackwell.

-----. [1993] “The Conceptual Contingency of Mathematical Objects.” *Mind*. Vol. 102. 285 – 289.

-----. [1998] “Which Mathematical Undecidables Have Determinate Truth-Values?” in Dales, H. Garth and Gianluigi Oliveri (ed.), Truth in Mathematics. Oxford: Oxford University Press. 291–310.

Fine, Kit. [1994] “Essence and Modality.” In J.E. Tomberlin (ed.), *Philosophical Perspectives, Vol. 8*. Oxford: Blackwell.

-----. [2002] “The Varieties of Necessity.” in Tamar Szabo Gendler & John Hawthorne (eds.), *Conceivability and Possibility*. New York: Oxford University Press. 253-281.

-----. [2012] “Guide to Ground.” in In Fabrice Correia & Benjamin Schnieder (eds.), *Metaphysical Grounding*. Cambridge University Press. pp. 37—80.

Godel, Kurt. [1947] “What is Cantor’s Continuum Problem?” *American Mathematical Monthly*. Vol. 54. 515 -- 525.

Hale, Bob. [1996] “Absolute Necessities.” *Philosophical Perspectives*. Vo. 10. 93—117.

-----. [2013] *Necessary Beings*. Oxford: Oxford University Press.

Hamkins, Joel David. [2012] “The Set-theoretic Multiverse.” *Review of Symbolic Logic*. Vol. 5. 416-449.

-----. [2015] “Is the Dream Solution of the Continuum Hypothesis Attainable?” *Notre Dame Journal of Formal Logic*. Vol. 56. 135-145.

Holmes, Randall. [1998] *Elementary Set Theory with a Universal Set*. Cahiers du Centre de Logique. Academia, Louvain-la-Neuve (Belgium).

Joyce, Richard. [2001] *The Myth of Morality.* Cambridge: Cambrdige University Press.

Kilmister, Clive W. [1980] “Zeno, Aristotle, Weyl and Shuard: Two-and-a-Half Millenia of Worries over Number.” *Mathematical Gazette*. Vol. 64. 149 – 158.

Koellner, Peter. [2009] "Truth in mathematics: The question of pluralism," in O. Bueno and Ø. Linnebo (eds), *New Waves in Philosophy of Mathematics*, New Waves in Philosophy, Palgrave Macmillan, pp. 80–116.

Kment, Boris. [2015] "Modality, Metaphysics, and Method." in Chris Daly (ed.), *The Palgrave Handbook of Philosophical Methods*. Palgrave Macmillan UK.

-----. [2014] *Modality and Explanatory Reasoning*. Oxford: Oxford University Press.

-----. [2006] "Counterfactuals and the Analysis of Necessity." *Philosophical Perspectives* 20, 2006, pp. 237-302.

Kripke, Saul, [1980] *Naming and Necessity*. Cambridge: Harvard University Press.

Lange Marc. [1999] "Laws, Counterfactuals, Stability, and Degrees of Lawhood." *Philosophy of Science*. Vol. 66. 243 – 267.

-----. [2009] *Laws and Lawmakers*. Oxford: Oxford University Press.

Leech, Jessica. [2015] "Logic and the Laws of Thought." *Philosophers' Imprint*. Vol. 15. 1—27.

----- and Bob Hale. [Forthcoming] "Relative Necessity Reformulated." *Journal of Philosophical Logic*.

Lewis, David. [1979] "Counterfactual Dependence and Time's Arrow." *Nous*. Vol. 13. 455-476.

-----. [1983] "New Work for a Theory of Universals." *Australasian Journal of Philosophy*. Vol. 61. 343—377.

-----. [1986] *On the Plurality of Worlds*. Oxford: Blackwell.

Lowe, E.J. [2012] "What is the Source of Our Knowledge of Modal Truths?" *Mind*. Vol. 121. 919—950.

Linsky, Bernard and Zalta, Edward N. [1995] "Naturalized platonism versus platonized naturalism" *Journal of Philosophy*. Vol. 92. 525–555.

Martin, D.A. [1998] "Mathematical Evidence" in Dales, H.G. and G. Oliveri (eds.), *Truth in Mathematics*. Oxford: Clarenden.

McFedridge, I.G. [1990] "Logical Necessity." in John Holdane and Roger Scruton (eds.), *Logical Necessity and Other Essays.* London: Aristotelian Society.

Moore, G.E. [1903] *Principia Ethica*. Available online at: http://fair-use.org/g-e-moore/principia-ethica/

Mortensen, Chris. [1989] "Anything is Possible." *Erkenntnis*. Vol. 30. 319—337.

Nelson, Edward. [1986] *Predicative Arithmetic (Mathematical Notes. No. 32)*. Princeton, NJ: Princeton University Press.

Nolan, Daniel. [1997] "Impossible Worlds: A Modest Approach." *Notre Dame Journal of Formal Logic*. Vol. 38. 535 – 572.

-----. [2011] "The Extent of Metaphysical Necessity." *Philosophical Perspectives*. Vol. 25. 313-339.

Nozick, Robert. [1981] *Philosophical Explanations*, Cambridge, MA: Harvard University Press.

Peacocke, Christopher. [1997] "Metaphysical Necessity: Understanding, Truth and Epistemology", *Mind*, 106: 521–74.

Potter, Michael. [2004] *Set Theory and Its Philosophy.* Oxford: Oxford University Press.

Plantinga, Alvin. [1982] "On Existentialism." *Philosophical Studies*. Vol. 44. 1—20.

Priest, Graham (ed.). [1997] Special issue of the *Notre Dame Journal of Formal Logic* on impossible worlds. Vol. 38. 481–7.

-----. [2012] *An Introduction to Non-Classical Logic: From If to Is.* New York: Cambridge University Press.

-----. [2016] "Thinking the Impossible." *Philosophical Studies.* Vol. 10. 2649-2662.

Quine, W.V.O. [1943] “Notes on Existence and Necessity.” *Journal of Philosophy*. Vol. 40. 113—127.

-----. [1947] “The Problem of Interpreting Modal Logic.” *Journal of Symbolic Logic*. Vol. 12. 43—48.

Rosen, Gideon. [2002] “A Study of Modal Deviance.” in Tamar Szabo Gendler and John Hawthorne (eds.), *Conceivability and Possibility*. Oxford: Clarendon.

Rowe, William. [2007] “The Problem of Divine Protection and Freedom” in Nick Trakakis (ed.), *William L. Rowe on Philosophy of Religion: Selected Writings.* Aldershot: Ashgate.

Rumfitt, Ian. [2015] *The Boundary Stones of Thought.* Oxford: Oxford University Press.

Russell, Bertrand. [1919] *Introduction to Mathematical Philosophy*. New York: The MacMillan Co. Available online at: http://people.umass.edu/klement/imp/imp.html

Shapiro, Stewart and Crispin Wright. [2006] “All Things Indefinitely Extensible.” in Rayo, Augustin and Gabriel Uzquiano (eds.), *Absolute Generality*. New York: Oxford University Press.

Sidelle, Alan. [1989] *Necessity, Essence, and Individuation: A Defense of Conventionalism*. Ithica: Cornell University Press.

Sider, Ted. [2011] *Writing the Book of the World.* New York: Oxford University Press.

Stalnaker, Robert. [1976] “Possible Worlds.” *Nous*. Vol. 10. 65-75.

Unger, Peter. [2014] *Empty Ideas: A Critique of Analytic Philosophy*. New York: Oxford University Press.

Vaidya, Anand, "The Epistemology of Modality", *The Stanford Encyclopedia of Philosophy* (Winter 2016 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/win2016/entries/modality-epistemology/>.

Van Fraassen, Bas. [1997] "The Only Necessity is Verbal Necessity." *Journal of Philosophy*. Vol. 74. 71—85.

Van Inwagen, Peter. [1990] *Material Beings.* Ithica: Cornell University Press.

-----. [1997] "Modal Epistemology". *Philosophical Studies*. Vol. 92. 68—84.

Wang, Jennifer. [2013] "From Combinatorialism to Primitivism." *Australasian Journal of Philosophy.* Vol. 91. 535–554.

Williamson, Timothy. [Forthcoming] "Counterpossibles." in Brad Armour-Garb and Fred Kroon (eds.), *Philosophical Fictionalism*.

-----. [2016] "Modal Science." *Canadian Journal of Philosophy*. Vol. 46. 453 – 492.

-----. [2013] *Modal Logic as Metaphysics*. Oxford: Oxford University Press.

[2007] "Philosophical Knowledge and Knowledge of Counterfactuals," in Christian Beyer and Alex Burri (eds.), *Philosophical Knowledge — Its Possibility and Scope*. Amsterdam: Rodopi.

Wilson, Alastair. [2013] "Schaffer on Laws of Nature." *Philosophical Studies*. Vol. 3. 653—657.

Wilson, Mark. [1983] "Why Contingent Identity is Necessary." *Philosophical Studies*. Vol. 43. 301—327.

Wittgenstein, Ludwig. [2014] *Tractatus-Logico Philosophicus*. New York: Routledge.

Wright, Crispin. [1986] "Inventing Logical Necessity." in Jeremy Butterfield (ed.), *Language, Mind and Logic*. Cambridge University Press.

-----. [1988] "Why Numbers Can Believably Be." *Revue Internationale de Philosophie*. Vol. 42. 425—473.

Yablo, Stephen. [1993] "Is Conceivability a Guide to Possibility?" *Philosophy and Phenomenological Research*. Vol. 53, 1-42.