Anti-Ockhamism and the Epistemology of Metaphysics

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1. The methodological ethos of recent analytic metaphysics incorporates what may seem to be an odd mix of empiricist restraint and rational exuberance. In some parts of the subject e.g., the metaphysics of physics — it is widely held that Ockhamist science should be our guide, and that we are therefore under pressure to keep our posits and principles to a minimum. And yet in other parts of the subject it is widely held that any credible view will posit an insane abundance of things. Our theories of mathematical reality, for example, routinely posit vastly more than is needed for any concrete explanatory purpose; and yet these theories would be defective — both by mathematical standards and by philosophical standards — if they were truncated. The same goes for our theories of objects in other categories: wholes composed of parts, parts discerned in wholes (including personites), material objects individuated by their modal profiles (statue, clay, etc.); abundant properties and propositions and so on. In all of these areas we (or at least some of us) take it for granted that speaking roughly, there are as many things of each relevant kind as there could possibly be, whether anyone needs them or not. When it comes to this part of the subject, not only is there no imperative to get by with less; there is a contrary imperative to leave no would-be entity behind.

This aspect of our thinking raises many questions. There is first of all what might be called the demarcation question: how to distinguish the areas in which anti-Ockhamist norms of theory choice apply from those in which Ockhamist norms hold sway. And of course there is the difficult technical question how to formulate the anti-Ockhamist norm and the various principles of plenitude it supports without lapsing into paradox. I will have a few words to say about the demarcation question in a moment (and next to nothing to say about the technical question). But for present purposes, given the occasion, I want to focus on epistemological issues. In Ockhamist domains it makes sense to ask a familiar question: Why should the fact that T is more economical than the alternatives count as a reason, not only to favor T for practical purposes, but also to believe that T is true? In anti-Ockhamist domains it makes sense to ask the less familiar question: Why should the fact that T is more economical than some alternative count as a reason to believe that T is *false*? The main business of this paper is to focus on these epistemological issues, and in particular on the comparative question: Is the impulse to plenitude in anti-Ockhamist domains to be justified in the same way as the impulse to economy in Ockhamist metaphysics, or do these two opposed norms have different sources? The point of the comparative question will, I hope, emerge as we proceed.

2. On the demarcation question a natural starting point is Schaffer's suggestion that parsimony is relevant to theory choice only insofar as the theory concerns the *fundamental* level: the level of ungrounded facts and things (Schaffer 2014). It may count against a bit of chemistry that it posits 6 atoms when it could get away with 5; but it does not count against the theory if it posits 57 mereological sums of two or more of these atoms, as if we would somehow be doing better chemistry if we could get away with 56. This of course sounds right. The clearest exemptions to the scientific impulse to parsimony in

recent metaphysics come from theories that concern non-fundamental things like sets and mereological composites and other derivative or grounded entities; so let's suppose that Schaffer has drawn the line in roughly the right place.

Even so, the principle as stated — Schaffer's Laser — does not support the anti-Ockhamist's distinctive claim that it is positively *better* to have all 57 sums than it would be to get by with 56 even if that were possible. To capture this idea we want something along the following lines. Non-fundamental objects are generated from the fundamental array according to principles of generation like the principles of mereological composition and set formation. Theories can disagree about these generative principles, some imposing restrictions, others waiving them, still others rejecting the principles altogether. In this context the anti-Ockhamist's distinctive claim is that restricted generative principles are positively disfavored by the pertinent norms of theory choice, with ideal principles yielding a full plenum of generated objects over any given base — a plenum more abundant that which none can be conceived.

This is already a strong (if vague) position; but the anti-Ockhamism that interests me makes a stronger claim: Not only is each bona fide generative principle profligate; the generative principles as a class a replete, in the sense that every possible principle for generating new objects from old automatically operates given a suitable base. This is a substantial strengthening, and it would be a stretch to say that the "tradition" in analytic metaphysics is resolutely anti-Ockhamist in this strong sense. To the contrary, the constructionalist line that runs from Russell and Carnap through Goodman and Quine to Lewis tends to be parsimonious with respect to generative principles — mereology alone for Goodman; mereology and set theory alone for Quine and Lewis — while holding that the few admitted principles themselves are profligate. This core tradition is thus at best half-hearted in its anti-Ockhamism. There is however a minority tendency in recent metaphysics which I associate with Kit Fine and Steve Yablo and also certain neo-Carnapians, but which may not deserve the name "tradition" according to which the impulse to plenitude at the level of individual principles also favors a plenum of principles. This of course amplifies the risk of inconsistency. Individually consistent principles can easily turn inconsistent when combined [REF]. So it may well be that the ideal associated with this form of anti-Ockhamism is unattainable. Still it is the impulse to this sort of anti-Ockhamism that I wish to focus on, not least because I find myself powerfully drawn to it.

3. The impulse to plenitude is often assimilated to the impulse to minimize arbitrariness in our theories of the world — to draw no artificial or ad hoc or unmotivated lines. But these are different ideas. Suppose we start with countably many basic objects and ask for the generative principles according to which these things yield sets or sums. It would be objectionably arbitrary to suppose that they yield sets with 16 members but none with 17. But it would be much less arbitrary to suppose that they yield finite sets of every size but no infinite sets. The line between the finite and the infinite is the least arbitrary line in mathematics. And yet it would offend the anti-Ockhamist norm I have in mind to draw even this line. It is perfectly coherent to suppose that infinite sets and sums are generated from this basis, as we routinely do. According to the anti-Ockhamist,

this settles the reality of such things, even if it is possible to impose non-arbitrary restrictions that would avoid them. For the true anti-Ockhamist the generative principles are governed, not just by a requirement of non-arbitrariness, but by a requirement of *maximality* according to which (again speaking roughly) every avoidable restriction on the generative principles is to be avoided.

Maddy (1997) illustrates the contrast with a real example from higher set theory. Quine at one point says that having grudgingly admitted a universe of sets governed by the standard axioms, he is inclined to "round out" his theory with Gödel's Axiom of Constructability (V=L), a non-arbitrary restriction on the universe if sets that yields a theory sufficient for mathematical applications and which resolves otherwise open questions like the Continuum Hypothesis in an attractive way. For Quine the virtues of the proposal are "of a piece with the simplifications and economies that are hailed as progress in natural science" (Quine 1992, 95). And yet working set theorists reject V=L almost without exception.[1] Not only do they treat the Quinean economies as irrelevant to the choice of axioms; they regard the relative parsimony of the proposal as a *vice*. According to Maddy's detailed anthropology of the standards for theory choice applied by mathematicians at the cutting edge, set theory aims to provide a *maximal* arena for the study of mathematical structures. Since V=L restricts the range of available such structures, albeit non-arbitrarily, it is decisively disfavored by the anti-Ockhamist norms that inform this part of mathematics.

[1] The main exception is Jensen (1995) who finds the axiom attractive in part on Ockhamist grounds. See Arrigoni (2011) for a study of Jensen's position.

The impulse to maximize is thus distinguishable from the impulse to minimize arbitrariness. Of course they do not always conflict. A theory that maximizes the range of generated objects in a category, drawing no avoidable lines, will a fortiori draw no arbitrary lines. The point is rather that non-arbitrary theories need not maximize, and this is important for my purposes. Much of the anti-Ockhamism we seem to see in recent metaphysics *can* be understood as a reflection of the impulse to minimize arbitrariness; and insofar as this is the correct account it is not really anti-Ockhamism at all. Ockhamists like Quine routinely hold that one ground for expanding the ontology of a theory is to promote simplicity of other sorts: elegance or parsimony at the level of basic principles, for example. A principle of unrestricted mereological composition is in one way simpler than any restrictive principle in this sense, even when the restriction is non-arbitrary. And so the Ockhamist *may* say that at the end of the day, given the value of economy at the level of principles, the best overall view posits no avoidable restrictions. A theory that draws no avoidable lines will always be in one way simpler, even if it is in another way more profligate.

If this is right then the anti-Ockhamist could conceivably arrive at the same result as the anti-Ockhamist, endorsing unrestricted principles and perhaps even an unrestricted plenum of such principles. And yet she will have arrived there by a different route and in a very different spirit. For the Ockhamist, the ontological profligacy of the unrestricted principles is a cost, albeit one that may sometimes be worth paying. For the anti-Ockhamist it is a positive benefit. The two approaches are most likely to yield different result when truly elegant restrictive principles are available as alternatives to the maximalist principles in the domain. The case of set theory could be an example, but so is any case in which we have the option of rejecting the novel posits altogether, as with compositional nihilism or nominalism in the philosophy of mathematics. In cases of this sort the Ockhamist will see weighty if not decisive reasons to favor the restrictive view — as Quine did in the case of nominalism, or failing that, V=L —whereas the anti-Ockhamist will see none at all.

One last remark on this point. So far I have spoken loosely of reasons to "favor" one theory over another, but this sort of language can be slippery. For one sort of pragmatist, the questions we have been discussing are questions about which theories to *use* for one or another purpose. Maddy sometimes speaks in these terms. Set theory aims to maximize the range of isomorphism types countenanced by the theory because it is useful for mathematical purposes to have a well-stocked toolshed. But whatever the merits of this way of speaking, that is not what I have in mind. The Ockhamist I am talking about treats the relative simplicity of T as a reason to believe that T is true; the anti-Ockhamist treats the fact that T is restrictive (arbitrarily or otherwise) as a reason to believe that T is false. So even when the impulses converge on the same result — that we are justified in accepting classical mereology, for example — they will disagree about the epistemic ground for that result. For the Ockhamist, the ontological profligacy of the view will register as (overridden) evidence against it; for the anti-Ockhamist it will register as weighty evidence in its favor.

4. The epistemological problem for the anti-Ockhamist is to say why we are justified in regarding the restrictive character of a theory as reason to reject it (when it is). I want this to be analogous to the familiar question from the philosophy of science: Why is it reasonable to believe the simpler of two otherwise comparable theories (when it is)? In both cases, the epistemological principle of theory choice amounts to the claim that a certain substantive proposition about the domain is justified a priori, in advance of inquiry. In Ockhamist domains this is the (hard-to-articulate) claim that fundamental reality is as simple as it can be given the phenomena. In the anti-Ockhamist case it is the claim that derivative reality is as abundant as it can be given the fundamental array. In both cases a theorist who endorses the relevant norm faces the question: Why exactly is it reasonable to accept the corresponding metaphysical claims a priori, given that alternatives are conceivable? Do we have positive *reason* to accept them — the sort of reason that might be offered to someone who was inclined to doubt them? If not, what can be said about why it is reasonable to accept these substantive claims when no reasons for them can be given?

The epistemological problem for Ockhamist can seem especially pressing since in these domains the relevant metaphysical claim is at best a contingent truth. Suppose all of the evidence is in and all of the possibilities for the fundamental level consistent with the evidence laid out before us. The Ockhamist tells us, speaking crudely, that if from among these alternatives, T is the simplest then T is (probably) true. Anyone who says this must regard the conditional 'if E then T' as credible a priori. And yet this claim is at best a contingent truth, since there will always be worlds consistent with the evidence in which the underlying reality is pointlessly complex. The hard question for the Ockhamist is roughly the question that awoke Kant from his dogmatic slumber: Why is it reasonable to suppose a priori that the world is as simple as it can be given the evidence when pointlessly complicated worlds are possible for all we know?

The question is pressing because it seems to cry out for a secular answer to rival pre-Kantian rationalist's answer: that as we can know a priori, the benevolent God who made the world gave rational creatures a sensibility to match the taste for simplicity that guided his creation. Absent some substantive alternative to this conceit, we have the disappointing-to-undergraduates fallback: "It is reasonable to believe the simpler theory, and so to believe a priori that the world is simple, because that is what reasonable people do. No positive reason for this substantive commitment can be given, but none is needed. It is rather an axiom of normative epistemology — an underived constraint on rational priors, perhaps — that it is reasonable to presume that the world is simple." A philosopher who takes this line may add: "We philosophers have reason to affirm this norm because scientists accept it and natural science is our best guide to the genuinely binding epistemic norms. But this is not an explanation for why the epistemic norm obtains. It is at best an account of why it is reasonable of us to accept it. For all the Ockhamist has said, it may be that the norm itself is fundamental.

The anti-Ockhamist about derivative reality is not in quite the same predicament. Since she holds that it is reasonable to accept only maximal generative principles and only replete systems of such principles, she is committed to the metaphysical view that derivative reality is replete and maximal (given the base), and to the epistemic view that it is reasonable to believe this a priori. But unless she is an eccentric "contingentist" who thinks that the generative principles can vary from world to world (Rosen 2006), she thinks that the metaphysical view to which she is committed by her methodology holds with metaphysical necessity and hence that there is no possible world in which cleaving to her principles leads to error. And yet her metaphysical view remains substantive, in the sense that there are coherent, thinkable alternatives. These include the alternative that posits no generative princippes at all; alternatives that posit a minimum of individually unrestricted principles à la Goodman and Lewis; alternatives that posit non-arbitrary restrictions on the generative principles like Quine's tentative embrace of V=L or van Inwagen's vitalist restrictions on mereology (van Inwagen 1990); and of course the many undiscussed alternatives that posit gruesome arbitrary restrictions. If the true principles of generation hold of metaphysical necessity, these alternatives are impossible in the strongest sense. So a theorist who accepts the true view runs no modal risk of error. Still she does stick her neck out, rejecting a priori a vast range of coherent ways for derivative reality to be in favor of her maximalist alternative. And so it is fair to ask her: Why is it reasonable to do that?

At this point it is open to her to ape the disappointing answer we attributed to the Ockhamist when she was challenged to defend her a priori metaphysical commitment. "Why is it reasonable to believe that the derivative world is replete when coherent alternatives are available? Because that's what rational people do. No positive reason can be given, so we have nothing useful to say to someone who does not feel moved to maximize, much as we have nothing useful to say to the Martian who doubts that the sun will rise tomorrow. And yet it is an axiom of normative epistemology — an underived constraint on rational priors, if that makes sense in this connection — that insofar as we are reasonable we are confident that there are as many sets and sums and hylomorphic composites as there could possibly be given the ungenerated array."

It is my firm hunch that we have missed our exit if we find ourselves saddled with this unimpressive speech. The Ockhamist in fundamental ontology really is taking a stand that calls for justification of some sort, ruling out genuine possibilities a priori. This may well be warranted in the end, but if it is that is no thanks to any independent guarantee that her razor-informed thinking must be reliable. The fitting response to this predicament is thus a permanent low-grade anxiety in recognition of the genuine risk that even the best rational thinking might miss its mark. The anti-Ockhamist, by contrast, seems to me to be in much better shape. The appropriate affective response to her predicament is not anxiety — "But how can I *know* that reality will gratify my taste for maximizing generative principles?" — but ataraxia: the serene conviction that nothing can go wrong. The challenge is to say how this can be.

5. This is of course the sort of thing that antirealists about philosophical ontology inspired by Carnap want to say. As they see it, no genuine factual question is stake when we are wondering about framework principles for generating derivative things like sets or sums, so no positive justification for maximalist versions of the principles is required. I reject this sort of view since I don't see how there can fail to be a factual (truth-evaluable) question about how many derivative objects of a given sort there are.

What I want to say instead begins with Cantor and Hilbert on free postulation in mathematics. Cantor famously said that the essence of mathematics lies in its freedom. The history of modern mathematics is, inter alia, the history of the expansion of the subject matter of mathematics from structures connected more or less directly to the study of space and time to more abstract structures and systems — the complex numbers and other extensions of the classical number system, the various systems of non-Euclidean geometry, etc. — with no such connection. These new objects and structures are introduced in effect by postulation. The mathematician lies down principles designed to characterize the objects of study and simply proceeds as if objects conforming to the principles were available. The key idea in both Cantor and Hilbert, despite their differences, is that mathematicians are "free" to proceed in this way, in the sense that so long as the principles governing the new objects are consistent there is no further mathematical question whether objects corresponding to them exist. Complex numbers, non-Euclidean spaces and the rest exist automatically, in the same sense in which the natural numbers exist, simply in virtue of the consistency of the theories that introduce them. Moreover this so not only because every consistent theory of this sort has a set theoretic model, in which pure sets, characterized independently, can be enlisted to play the roles of the novel posits. This is true, but incidental. The mathematical case for the complex numbers is settled by the coherence of complex analysis, independently of the fact that surrogates can be found in set theory.

Here is a rough metaphysical elaboration of this idea. Although this is not true in general, when it comes to pure mathematics the existence of objects of a certain kind simply consists in there being no obstacle to their existence. Every kind K of mathematical object has an essence: a specification, inter alia, of what Ks would be if there were such things. The essence of a mathematical kind may be purely formal, given by the purely logical Ramsey sentence of the corresponding theory; but it may also involve more, e.g., the idea that sets are *built* from their members. Objects of a given kind are possible when their existence is consistent with the essential truths. (This is a special case of the more general claim, which I accept, that for a proposition to be metaphysically possible just is for it to be consistent with the essential truths, as in Fine 1994.) In the mathematical case, however, the essence of a kind includes a distinctive existence condition: For all mathematical K, it lies in the essence of K that Ks exist if and only is *and because* it is possible for Ks to exist. Just as it lies in the nature of *vixen* that vixens exist in virtue of the existence of female foxes, so it lies in the nature of *complex number* that the complex numbers exist if and only if and because it is metaphysically possible for objects answering to the essential specification of them to exist.

The phrase "if and only if and because" is meant to signify the tightest possible metaphysical explanatory connection: essential equivalence plus full metaphysical grounding. To say that p obtains iff and because q obtains in the relevant sense is to say that it lies in the nature of (some constituent of) p that p is fully grounded in q whenever p obtains and obtains whenever q obtains. When this relation holds, the grounded fact *consists* in the fact that grounds it and is thus barely distinct from the underlying fact — barely anything over and above it, as we sometimes say. (A less fine-grained theory might identify the facts altogether, as would be highly plausible in the case of [*a* is a vixen] and [*a* is a female fox]. But to identify the facts is to deny that the one explains the other, since nothing explains itself. And it is important for my view that in the cases of interest, the modal fact that Ks are possible explains the fact that Ks exist.) Stated roughly, the proposal is that when it comes to mathematical objects, the existential fact [$\exists$x Kx] consists in, or reduces to, the corresponding modal fact [$\Diamond\exists$x Kx] in this tight sense. The best way of making sense of Cantorian freedom is to say that in the mathematical case, there is no metaphysical daylight whatsoever between the possible existence of a mathematical entity and its real existence.

Or better: that is the right thing to say about the objects of pure mathematics. The existence of an impure mathematical object — an impure set, for example — depends on the real existence of the objects from which it is constructed, and in general this is not a matter of their merely possible existence. If Albert is an ordinary contingent thing then the sets and functions based on Albert are likewise contingent. So we should not say that the existence of {*a*}consists in the fact that it is possible for {*a*} to exist; the latter is a necessary truth, and a contingent truth cannot consist in a necessary truth. Rather we should say: it lies in the nature of the set {*a*} to exist if and only and because the contingent fundamental array is consistent with its existence. In the case of pure mathematical objects, this reduces to the previous idea: that the existence of x consists in the possible existence of x. So the idea that covers every case looks like this: For all mathematical kinds K, it lies in the nature of K that Ks exist if and only and because the fundamental array is consistent with the existence of Ks.

6. Much more might be said about this metaphysical proposal, but since our focus here is epistemology, let's turn to that. The most important feature of the view is that it reduces epistemological questions about the existence of mathematical objects to questions about the epistemology of possibility, which in turn reduce to questions about the epistemology of essence. These questions are of course non-trivial. It is entirely fair to ask how we know what we know about *what it is* for a mathematical object to exist, just as it is fair to ask how we know what we know what it is to be a vixen. But given answer to this question, there would be no further mystery about how we know that (say) infinite sets exist. We somehow know that it is possible — consistent with the essences of things — for an infinite set to exist, and also that it lies in the nature of (pure) sets to exist whenever they are possible. Given this modal knowledge, our knowledge of the real existence of these things is unmysterious. Morerover the case might be made that this not merely one possible route to knowledge of mathematical existence. Insofar as mathematical practice is Cantorian — positing objects and affirming their existence without compunction subject only to constraints of consistency — our *actual* route to mathematical opinion is a bona fide route to justified belief in mathematics, at least insofar as the modal judgments upon which the practice relies are themselves justified.

If this is right we have a preliminary story to tell, not just about our knowledge of particular existence claims in mathematics, but about a more general commitment to anti-Ockhamism in mathematics. As we have stressed, a theory that imposes avoidable restrictions on mathematical reality appears to be defective, both my mathematical standards and by philosophical standards. The anti-Ockhamist who endorses this methodological norm — reject theories that impose avoidable restrictions — is committed to affirming a priori that mathematical reality is replete. The epistemological challenge for the anti-Ockhamist was to provide some sort of justification for this commitment, and the looming threat was that we would find ourselves with nothing to say, treating this commitment as on a par with the Ockhamist commitment to the view that in fundamental respects the world is simple. If the view just sketched is on the right track, we can break this symmetry. In the Ockhamist case we have no metaphysical guarantee that the world is simple; to the contrary, we know for a fact that this is a contingent matter and hence that no such guarantee is possible. In mathematics, by contrast, we do have a metaphysical guarantee that anti-Ockhamist thinking will track the truth. We know what it is for mathematical objects to exist and this insight assures that insofar as our anti-Ockhhamist methods reliably track consistency, they will automatically track the truth as well.

7. Let me now return to our official topic: anti-Ockhamism in the study of derivative, generated things. Start by noting that the view just sketched sees mathematical entities as derivative entities across the board (and not just in the special cases in which the mathematical theory itself affirms that some of its objects are generated from others, as in the iterative view of sets). The existence of the null set or the complex numbers or any other such structure is not a fundamental matter, as it might be for a Platonist with a capital 'P'. It is rather grounded in a modal fact — the fact that it is possible for objects with the required features to exist, which is in turn grounded in the essence-theoretic fact

that it is consistent with the essential truths that such things exist. This is not a paradigm case of generation. In the paradigm cases the derivative objects are generated from previously given *objects*. But it is generation nonetheless. The object-involving facts are generated from prior modal facts that do not involve or presuppose the existence of the generated items.

The proposal I want to explore sees the paradigm cases of generation as instances of this less familiar pattern. Start by with the point, noted briefly earlier, that we should not say, in general, that a derivative thing exists whenever its existence is possible. At worlds where Obama does not exist, it is nonetheless true that Obama could have existed, and hence that Obama's singleton could have existed. And yet Obama's singleton does not exist without Obama. So in the case of impure sets and many other generated things, it would be a clear mistake to regard the existence of the thing as grounded in the unconditional possibility of its existence.

Instead we say this. Let's say that an object is *b*-possible in *w* iff it is consistent with the fundamental array at *w* that the object exists. If Obama exists at *w* in virtue of the fundamental array serving him up, then and only then is it *b*-possible at *w* that {BHO} exists. The proposal thing is that in general, derivative things exist when they do in virtue of the fact that it is b-possible for them to exist. More exactly, the claim is that for each derivative kind K it is essential to K that Ks exist when they do in virtue of the fact that it is b-possible for them to exist. As above, this amounts to a reductionist claim: When a derivative object d exists, the fact that d exists reduces to the fact that it is b-possible that d exists. Equivalently, the existence of the derivative thing just *consists* in its b-possibility. The purest derivative objects, including the pure mathematical objects, are a limiting case in which the existence of the derivative thing requires nothing of the basic array. Earlier I said that it lies in the nature of these things to exist in virtue of its being possible for them to exist; but I might just as well have said that it lies in their nature to exist in virtue of its being b-possible for them to exist, since for these things, possibility and b-possibility coincide. So this gives us a completely general thing to say about the derivative domain: For each non-fundamental kind K it lies in the nature of K that Ks exist if and only and because it is b-possible for them to exist.

This proposal can sound odd, even to ears that are used to this sort of thing. Philosophers who tolerate the language of grounding and fundamentality routinely say that the existence of an impure set is grounded in the existence of its members, that the existence of a material complex is grounded in the existence and arrangement of its parts, and more generally, that the existence of a derivative entity is grounded in the configuration of its generators, understood as the more fundamental *objects* that give rise to it. (In this frame of mind, philosophers will sometimes say that the purest non-fundamental objects are *zero-grounded*, generated from nothing but generated nonetheless (Fine 2012, Kappes 2024).) This standard view gives no role to modal facts in the account of how the derivative things are grounded, grounding [{BHO} exists] in [BHO exists] with no modal intermediary. If this is meant as a claim of full and immediate grounding, my is different; but it is consistent with the core of this standard story. I say that [{BHO} exists] is immediately grounded in [$\Diamond_b${BHO} exists]. But if we ask why {BHO} is b-possible in (say) the actual world, the answer will be that [$\Diamond_b$ {BHO} exists] is grounded at least in part in [BHO exists]. So the view preserves the standard line that impure derivative things are grounded in the existence and arrangement of what we would normally call their generators, and ultimately in the basic array that generates the non-fundamental generators. The only difference is that my account interposes a modal step: the generators ground the b-possibility of the generated thing, which in turn grounds its actuality. (We could make the views even closer by modifying my view to say: the modal claim does not literally ground the existence of the derivative thing; that is grounded immediately in the relevant facts about the generators. The modal fact is relevant only at the meta-level: when we ask why [BHO exists] suffices to ground [{BHO} exists], the answer is that this grounding fact obtains because the existence of BHO makes the existence of the singleton possible. If there are strong reasons to favor this "metagrounding" version of the proposal over my official version, I am unaware of them.)

The advantage of imposing the modal step is that this renders both the necessity and the necessary profligacy of the generating principles unmysterious. Why should the existence of a concrete human being, Barack Obama, suffice all by itself, *as a matter of absolute necessity*, to generate an object so unlike a human being? On one view of these matters — tentatively endorsed by me in an earlier paper — the generative principles that mediate these connections are substantive, synthetic laws of metaphysics, the most basic of which are brute, ungrounded facts. But that view struggles to explain why these connections should be necessary, why they should be profligate, and why they should be replete. Perhaps more importantly, it fails to explain why they should seem so unambitious, so unproblematic and so unexciting. On this view, the Ockhamist who is inclined to reject these principles is within her rights to say: “I know what sets and sums and the rest are supposed to be: they are the objects that would be generated in accordance with the metaphysical laws you’ve written down if those laws obtained. Still I am inclined to reject those laws, or to wonder about them, perhaps on grounds of parsimony, perhaps because any particular battery of such principles seems hard to motivate given the vast range of possibilities.” Of course we can then argue about whether the balance of theoretical considerations favors a replete battery of maximalist generative principles in the end. But then the dispute will look like a substantive dispute in speculative ontology. Why should we be so lucky as to inhabit a world in which every possible suitably unrestricted generative principle is at work? Or better: What reason could we have to believe that we are so lucky? And if we have no reason, why should it be reasonable to take this as a starting point? There may be an answer, just as there may be an answer to the analogous questions for the Ockhamist: Why should be so lucky as to inhabit world in which the basic array is as simple as it can be given the appearances? But that would be an answer that justifies a beefy metaphysical thesis about our world.

On the present view, this way of looking at things involves a misconception of the relation between the fundamental and the derivative. The master claim is a claim about the nature of derivative existence: the existence of derivative things consists in their b-possible existence. If you like, that is their distinctive *mode* of being. Once we have swallowed this, questions about the existence of derivative things and the operative principles of generation reduce to modal questions. And given standard assumptions, these modal questions have non-contingent answers. If it is possible for Fs to exist (given the fundamental array), then it is necessarily possible for Fs to exist (when the fundamental array is as it is). The view thus explains the non-contingency of generative principles, the necessarily maximal character of those principles, and the necessary repleteness of the battery of such principles all as a special case of the necessity of possibility. Moreover, the view blunts whatever epistemic problem their might have seemed to be about these matters, or at least reduces the problem to a single more general mystery. On the present view, anyone who knows what it is for derivative things to exist — anyone who appreciates the nature of the derivative as such — is in a position to know that their existence consists in their b-possible existence and so to see no gap, metaphysical or epistemic, between the modal facts and the existential facts they ground.

Nothing similar can be said, with any plausibility, about the Ockhamist principle of parsimony that governs our thinking about the fundamental level. The existence of fundamental things — particles, spacetime points, the quantum cosmos as a whole, etc. — does not *consist* in their being posits of the simplest theory consistent with the evidence. This sort of reductive phenomenalism has occasionally been proposed; but it's clearly hopeless, not least because it inverts the explanatory order. The fundamental world is not as it is *because* the macroscopic appearances are as they are; it's the other way around. On the other hand, the derivative world is as it is because the fundamental world is as it is; that is a tautology. The present view goes beyond this only by adding that the fundamental array generates the derivative array by generating a range of modal facts in which the existence of the derivative things consists.

8. [This is where I ran out of time. Much more to say, especially about the coherence of the idea that possible existence grounds existence given that individually consistent theories of the derivative can be inconsistent with one another. (This is a version of the bad company objection to neo-Fregean Platonism.) The most important unfinished business is a comparison of this approach with nearby forms of deflationism is in the metaphysics of the derivative — Sider, Linnebo, Rayo, etc. I haven't started to think about this yet.]