

Existence and strong uncountability

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1. Introduction

Existence is standardly understood in terms of number: to affirm existence is to say there's one of something, to deny existence is to say there's zero. The formal $\exists xFx$ is taken to mean 'some F exists' and 'one F exists' (at least). So for something to exist is for one thing to exist: in slogan form, to be is to be countable.¹ E.J. Lowe (2009, 2003, 1998) argues something can exist without being countable, however: for Lowe there can be something without there being one such thing. His primary (though not only) example is homogenous "stuff", i.e., qualitatively uniform and infinitely divisible matter. Lacking nonarbitrary boundaries and being everywhere the same, homogenous stuff lacks a principle of individuation that would yield countably distinct constituents. Put another way, though divisible no division of homogenous stuff has unity, according to Lowe, and so fails to count as a unit- as one single thing. For Lowe homogenous stuff is *strongly uncountable*: rather than there being too many (or too few) to count, number is not even in principle assignable to it (2009: 49-50, 2003: 328-9, 336, 1998: 72-74).

Olson (2011) rejects Lowe's view and defends the orthodox connection between existence and number. He argues that if there is any stuff there is a (determinate) number of portions of stuff. So existence entails countability after all. Sider (2011, 2001) also rejects a stuff ontology, claiming it is incompatible with his preferred view that the familiar quantifiers

¹ What I'm calling the standard view is of course traceable to Frege, who claimed that "existence is analogous to number. Affirmation of existence is in fact nothing but denial of the number ought" (1884/1960: 65). Van Inwagen (2009) endorses Frege's claim, and considers it a central plank of the now-orthodox "neo-Quinean meta-ontology" (p. 483).

of predicate logic carve at nature's joints. In particular Sider argues that the success and indispensability of the standard quantificational apparatus—according to which to be is to be countable—shows that the world is ultimately a world of (countable) things not (uncountable) stuff.

Against these arguments I defend the uncountability of stuff and the possibility (if not actuality) of existence without countability. If to be is to be countable, more is needed than the arguments that Olson and Sider provide. Existence without countability deserves more serious consideration than it is typically given.

2. On the coherence of strong uncountability

First a brief bit of terminology. Assuming there are infinitely many numbers there are too many numbers to count; there are, as it is commonly said, uncountably many numbers. But this is not the sense of uncountability at issue here. Numbers collectively are uncountably many, but individually each number is countable as one. So numbers are only *weakly uncountable*. Lowe's claim regarding homogenous and infinitely divisible stuff is different. Stuff is *strongly uncountable*: no portion or division of stuff is countable as one single thing (cf. Olson 2011: 70).² In this paper talk of (un)countability is talk of strong (un)countability. Accordingly the claim that each thing is countable (as one) will be called *the*

² Properly formulating Lowe's thesis is tricky. One may be tempted to express the idea as something like 'each individual portion of stuff is strongly uncountable'. But 'each' is a singular term, and Lowe denies that a portion of stuff is a single thing. He also denies that portions or divisions of stuff are *individuals* at all. Instead Lowe introduces the term *dividual* to mean a kind of entity not countable as a single thing, specifically to contrast with (countable) individuals (2009: 50, 2003: 329, 1998: 61). So the uncountability thesis might also be put as the claim that not every entity must be individual, as some may be dividual. Due to its unfamiliarity, however, I won't use Lowe's term of art in this paper. Still it may be helpful to keep in mind that Lowe thought the uncountability thesis best expressed by a neologism with metaphysically imperspicuous grammar (e.g. 'dividual' is a count noun standing for something uncountable).

countability thesis. Its negation—the *uncountability thesis*—is true if something may exist without being (strongly) countable.

Is strong uncountability even coherent? Despite rejecting Lowe’s view Olson’s framing of the issue is helpful. When first learning quantified logic as a student, Olson recalls, he was told that for something to exist is for there to be one such thing (2011: 66). This is hardly unusual: certainly it is standard practice to tell students that the formal string ‘ $\exists xFx$ ’ is to be read out loud, understood, or taken to mean ‘something is F’, ‘there exists an F’, and ‘there exists (at least) one F’. So for any philosopher who learned (or teaches) quantified logic this way the countability thesis—in slogan form, to be is to be countable—is likely ingrained (cf. Olson 2011: 67). Given Lowe’s claims just outlined, however, this pedagogy is not entirely innocent. If ‘ $\exists xFx$ ’ means ‘some F exists’ and ‘one F exists’, then to say ‘some F exists but no one thing is F’ is self-contradictory, incoherent, or analytically false. Yet few philosophers think the truth or falsity of metaphysical theses should be decided on definitional or analytic grounds. So in the interest of metaphysical debate one should deny that countability is built into the meaning (or form) of existence claims.^{3,4}

This is not a mere nicety, however. Sentences asserting existence without countability are a familiar feature of English grammar. Consider the familiar distinction between count and mass nouns (or, more precisely, between count and mass senses of nouns). As the name implies, only count nouns take numerical prefixes. Because ‘there is some matter’ is grammatical, for example, but ‘there is/are 5 matter(s)’ is not, ‘matter’ is here used as a mass noun. Of course one might say ‘there are five portions of matter’ instead, for example, but

³ There is certainly no need to read ‘ $\exists xFx$ ’ in terms of number. After all, as a formal string it can be interpreted or understood in various ways, or even left uninterpreted. Once it is pointed out that a certain reading may build into it a substantive metaphysical thesis, dialectical neutrality likely demands an alternate reading, at least in the present context.

⁴ Cf. Lowe (2003: 328): “While ‘everything is something’ is, apparently, a trivial truth of logic, ‘everything is some *thing*’ looks more like a substantive metaphysical claim” (original emphasis).

this is just to replace a mass expression with a count expression. From a grammatical point of view this is quite unnecessary; mass expressions are perfectly well-formed on their own. So grammatically speaking existence can be asserted of something without there being some number of what is said to exist.

That English grammar allows sentences to assert existence without number does not establish that there really can be existence without number, of course. Perhaps such sentences are not metaphysically perspicuous, such that for any putatively count-indeterminate state of affairs (seeming to correspond to a mass-term sentence) there is some count-determinate state of affairs to which the former is reducible or eliminable. For example suppose that what makes 'there is some matter' true is that discrete and so countable material particles exist. Lowe concedes this would be the case were matter only finitely divisible, in which case matter would be a plurality of distinct things rather than a stuff or mass (Lowe 2009: 50). Lowe's main defense of uncountability is that matter is not *necessarily* so composed, and so not necessarily a plurality rather than a mass. It is possible, Lowe thinks, for matter to be infinitely divisible rather than finitely divisible. He also thinks it possible for matter to be qualitatively uniform or homogenous. It is this possibility of homogenous and infinitely divisible matter that yields the possibility of existence without countability. The argument is that if matter were infinitely divisible and everywhere the same no division would yield one well-defined or discrete entity. Lacking boundaries or contrast with environment, the resulting portion would lack unity and so fail to count as a unit- a single countable thing. Put another way, homogenous and infinitely divisible matter lacks a principle of individuation that would render portions of matter countably distinct. (Such portions would thereby fail to be individuals at all; cf. note 2). Because homogenous matter cannot be enumerated or individuated as discrete particles can, cardinal number does not

apply to it. There could be matter—stuff—without there being a number of matter(s) or stuff(s). So for Lowe homogenous and infinitely divisible stuff is (or would be) strongly uncountable (2009: 49–50, 2003: 328–9, 336, 1998: 74–76).

This is not the only argument for the strong uncountability of stuff. Elsewhere I develop others as well as a variation of Lowe’s [author ms]. I’ll restrict my attention to the above-described iteration, however, because this is the version Olson takes up. And as indicated at the outset my aim in this paper is to reject Olson’s (and Sider’s) arguments against uncountability, rather than offer distinct positive arguments (as I do in the aforementioned paper). So consider Olson’s argument. Olson picks up on Lowe’s distinction between countable entities which contrast with their surroundings and have nonarbitrary boundaries, as opposed to homogenous stuff, any portion or division of which has arbitrary boundaries and does not contrast with its surroundings (2011: 72). Olson’s claim is that this distinction cannot be maintained, however. He argues that if there is any homogenous stuff there must be a number of portions (or divisions) of that stuff. The reason is that arbitrary portions [of stuff] can be made into discrete [and so countable] pieces by detaching the surrounding [stuff]. Likewise, it seems that a [countable] piece of [stuff] can cease to be a piece and become a mere arbitrary portion by being fused with another piece (2011: 78). Olson then claims that something’s uncountability cannot be a temporary or contingent feature of it; something cannot be uncountable at one time and countable at another (or in one world but not in another). Because “any [allegedly uncountable] arbitrary portion of stuff could have been a [countable] piece” but countability cannot be temporary or contingent, arbitrary portions must be countable after all (p. 79). Put another way, because any arbitrarily divisible portion of matter which lacks contrast with its surroundings could be rendered distinct from its surroundings by removing the adjacent matter, every portion of matter is countable after all.

Obviously Olson's argument relies on the (possible) separability (or combinability) of stuff, i.e., the ability to tear off bits or fuse bits together. In so doing one would create or destroy a boundary vis-à-vis an external environment. Doing this requires regions of non-stuff in between, however; only if there can be some stuff in one place and some other stuff elsewhere with something else (or nothing) in between does Olson's argument get off the ground. But there are situations in which this requisite separability does not obtain. For example instead of thinking of stuff *in* space think about space itself as a kind of stuff. After all, space may be infinitely divisible and qualitatively uniform. Divisions of space therefore lack nonarbitrary boundaries and contrast with surroundings, just as homogenous and infinitely divisible stuff does. The world could be space all-the-way-down in just the way it might be stuff all-the-way-down. So Lowe's arguments for the strong uncountability of stuff (may) apply to space itself.⁵ But in a space-all-the-way-down world there's no way to tear up portions of space and separate them in the way Olson imagines one can do with stuff. So the existence of (homogenous) space would not entail a number of portions of space. Space (so conceived) is therefore a counterexample to Olson's argument. This counterexample also handles the modal variant: in a space-all-the-way-down world no spatial region could have become countable, as there is no possibility of spatial regions separating (or fusing). So no arbitrary division of space would be merely temporarily uncountable. The same rebuttal to Olson applies in a possible world in which material stuff and space are distinct but the stuff constitutes a plenum, such that there's no space not filled with stuff. Then again there would be nowhere for the stuff to go; the idea of tearing stuff apart and thereby creating

⁵ Lowe even suggests as much (1998: 75). Moreover, Lowe thinks certain tropes and facts may be uncountable (1998: 78, *inter alia*). So he is hardly averse to extending the arguments for uncountability to other kinds of entities.

nonarbitrary external boundaries again fails to apply. *Mutatis mutandis* this undermines Olson's modal variant as well.

The point here is not that our world is in fact like this. That these scenarios are logically possible is all that's required. The traditional claim is that what it is to be is to be countable. Olson's claim is that existence entails countability, or at least that existence without countability is metaphysically impossible. Yet homogenous space-all-the-way-down worlds and stuff-plenum worlds are counterexamples to each. Each kind of world is conceivable and so logically possible (or so I will assume). There is also no particular reason to think these worlds are not metaphysically possible. Why couldn't space be homogenous and infinitely divisible? If it were then space would be a kind of stuff; arbitrary divisions of space would lack unity and so fail to be countable. Not because there would be too many to count, but because number would not be assignable, as Lowe argues. There would be existence without strong countability.

Yet for all that there may still be good reasons to reject an ontology of uncountable stuff, even granting it as an epistemic or metaphysical possibility in some sense. So in the next section I'll turn to Sider's argument, who holds that one ought to reject a stuff-ontology on grounds other than those discussed so far.

3. Stuff without quantifier variance

In the introduction to *Four Dimensionalism* Sider (2001) advances an ontological and a meta-ontological view. The ontological view is mereological universalism, according to which every collection of objects composes a whole.⁶ The meta-ontological view is that the question to which universalism is an answer—'which collections of objects compose

⁶ Sider (2011) no longer advocates universalism, however.

wholes?’—is a substantive question with an objective answer, over which disputants (genuinely) disagree. Sider calls the opposing meta-ontological position the ‘no-conflict’ view. On this view the dispute over which collections of objects compose wholes is merely apparent. Reasons for the no-conflict view vary, but the general idea is apparently incompatible claims regarding composition are only true or false relative to a conceptual-scheme or linguistic framework, such that the (apparent) disagreement is merely verbal or, perhaps, ill-formed.

So for Sider the critical meta-ontological question is whether a genuine rather than merely apparent debate over mereology is possible. For Sider this turns on another question: whether the language of the debate is connected to reality in the right way. In particular Sider thinks the issue is whether “modern logic’s quantificational apparatus mirrors the structure of reality” (2001: xvi), i.e., whether quantification carves at nature’s joints. If \exists carves at the joints then there is a metaphysically privileged use of \exists , for example, whereas if \exists does not carve at the joints there is no privileged use of \exists . For Sider questions framed in terms of metaphysically privileged or joint-carving language per force have substantive and objective answers, whereas questions framed via non-joint-carving terms lack such answers (cf. Sider 2011: 44-57). Regarding mereology in particular Sider believes whether a composite exists can be asked entirely in joint-carving terms, including \exists , and so has a determinate and objective answer.⁷ Naturally Sider takes proponents of the no-conflict view to reject these ideas. The no-conflict view with which he is most concerned is ‘quantifier variantism’ (as defended by e.g. Hirsch 2002), according to which there are various equally eligible candidates for the meaning of \exists , none of which are objectively privileged or which carve

⁷ This idea is also the foundation of the so-called “argument from vagueness” against moderate composition, as developed first by Lewis (1986: 212) and then Sider (2011: 122-139). See also Korman (2010) for a synthetic version, and Author [ms] for criticism.

nature at the joints any better than any other. According to quantifier variantism those who advocate different (first-order) views on mereological composition use their own preferred variant of \exists when saying mereological sums do or don't exist, such that each view comes out as (trivially) true in each's own language. The dispute over mereology is thus merely apparent: existence statements invoking different framework-relative meanings or variations of \exists are not genuinely incompatible. Because Sider argues there is in fact a privileged joint-carving use of \exists , however, he rejects the no-conflict view and defends the substantivity of the first-order debate.

It is within this framework that Sider considers a "stuff ontology" as opposed to a "thing ontology". In particular Sider worries that rejecting things in favor of stuff (a first-order view) leads directly to the (higher-order) no-conflict view he rejects. If "the world is fundamentally a world of stuff, not things", Sider writes, then "there is no one right thing-language, since there is no one right way to divide the world of stuff into things" (2001: xvii). But without a correct thing-language the debate over mereological composition would not be substantive or objective after all: different "thing-languages" (which quantify over different things) may each be correct according to its own framework or conventions. According to Sider, however, a 'thing language' is part and parcel of "modern logic's quantificational apparatus", which he believes "mirrors the structure of reality", as we've already seen. So for Sider a stuff ontology is incompatible with quantification carving at the joints, which in turn is incompatible with the substantivity of the debate over mereology. So Sider rejects a stuff ontology.

The implication for my previous argument is clear. Even if I'm right that (homogenous and infinitely divisible) stuff would be strongly uncountable if it existed, Sider's rejection of a stuff ontology amounts to a rejection of the actual strong

uncountability of what exists. It also puts pressure on a stronger modal thesis. If Sider is right then in any world where our quantificational apparatus carves at the joints there is no stuff, fundamentally speaking, such that what does exist would be strongly countable.

But Sider's arguments do not succeed. The central problem is Sider wrongly amalgamates "modern logic's quantificational apparatus" with a thing-language or thing-ontology. In fact he doesn't even acknowledge that they are (or may be) distinct. For example note the following transition (via the colon). Sider assumes "that modern logic's quantificational apparatus mirrors the structure of reality: I assume an ontology of things" (2001: xvi). My ascription is not based only a single punctuation mark, however. The view that quantification and a thing-language are (indistinct) parts of the same apparatus also manifests in the following passage (on the next page). Sider claims that a

stuff ontology must claim that a truly fundamental description of the world must completely eschew a thing-language. This requires completely eschewing the usual quantifiers and variables- the backbone of contemporary logic.. If one cannot say that there exist quantities of stuff, what *can* one say? A whole new language must be developed. Somehow, 'quantifiers' over stuff must be introduced without slipping into talk of things; somehow language must be invented to express all the facts about the world we take there to be, while not slipping into thing-language in disguise. (2001: xviii, original emphasis).

At first Sider claims a stuff-ontology must eschew things. Fair enough. But he then goes on to say a stuff ontologist cannot say *there exists* quantities of stuff. This is just wrong: of course a stuff ontologist can say there exists quantities of stuff. She can even do so via \exists . It's just that \exists would range over stuff rather than things. Yet for Sider, apparently, the link between \exists and thing-talk is so tight that using \exists to talk of stuff instead of things is enough to put 'quantifiers' in scare-quotes, as if the only genuine quantifiers are thing-quantifiers.

Now, in later work Sider does mention the possibility of quantification over stuff (2011: 183-4), where he also recognizes that quantification over stuff would (loosely) resemble natural language talk using mass nouns rather than count nouns (as I've discussed).

Even so he doesn't countenance the possibility that quantification and a thing ontology can come apart. On that same page he imagines a quantifier variantist (not simply a stuff ontologist) saying that he has "no need for objects in [his] fundamental description of the world. The world fundamentally consists of the distribution of properties over spacetime" (2011: 183). Sider's response to this imagined objection is to say "this is just confusion. Far from renouncing quantifiers in his fundamental language, this variantist helps himself to quantification over points and regions of spacetime" (ibid). But it is Sider who is confused here. The claim he attributes to the variantist doesn't say anything about getting rid of quantifiers; the attributed claim says there is no need for *objects*, not there is no need for *quantification*. Yet Sider seems to think getting rid of objects is tantamount to getting rid of quantification. Sider even doubles-down on this mistake in a footnote, where he declares that those who claim that modern physics has no need for objects "miss the point" he just made: "perhaps modern physics has no use for *particles*, but this doesn't show that it has no use for quantifiers" (p. 183 n. 36, original emphasis). It's not clear who makes this faulty inference, however. Sider doesn't cite anyone who makes the alleged mistake, for one.

Second, Ladyman and Ross (2009) are perhaps the most prominent proponents of the claim that physics denies the existence of objects (in fact their book is entitled 'Every Thing Must Go' for just that reason). But Ladyman and Ross quite explicitly argue that physics posits structural relations (instead of 'things'). So it is no part of their physics-rejects-things thesis that one can formulate physical theory without quantification, or that physics should do without the posits of its models. (Ladyman and Ross are very much scientific realists, after all.)

So what is going on here? My best guess is that Sider is conflating two very different senses of the words 'object' and 'thing'. One sense of 'object' (or 'thing') is roughly

equivalent to *substance*, and so contrasts with other (putative ontological categories such as) *event*, *property*, *structural relation*, and *stuff*. Another sense of ‘object’ is category-neutral, however, and appears in phrases such as ‘object of desire’ or ‘object of quantification’ (cf. Lowe 1998: 34). In this sense of the term anything that falls under the range of some quantifier would count as an object. But this includes, rather than contrasts with, events, properties, structural relations, and stuff. So yes, getting rid of objects in the latter sense might well be to get rid of quantification, insofar as quantification without there being something over which one quantifies doesn’t make sense. But when Ladyman and Ross deny there are objects they have in mind the sense of ‘object’ akin to ‘substance’. The same goes for a hypothetical defender of a no-object stuff ontology. To deny objects (substances) has nothing to do with denying quantification.

Pointing this out severs the (apparent) link between quantifier variantism and a stuff ontology. The defender of a fundamental stuff ontology may reject things (in the sense of objects or substances), but denying that \exists carves at the joints simply doesn’t follow. If the world fundamentally consists of stuff then stuff would *exist*, in the most fundamental joint-carving sense of the term. It’s just that in such a world \exists would range over stuff rather than things. (Granted, this may render \exists a non-singular quantifier, but thinking it must be singular—i.e., that it must range over a domain of single countable things—is to build too much metaphysics into the reading of a formal symbol.) Because stuff may be strongly uncountable, as argued previously, the claim here is that existence and countability may come apart. Even if there is a privileged sense of \exists , to be and to be countable need not be equivalent. Put another way, *quantification*—assertions of existence—could carve at the joints without *enumeration*—assertions of number—carving at the joints. Yes there is a tendency to

amalgamate these: witness the way we all learn predicate logic, including the claim that to be is to be countable. But as argued existence and countability may go their separate ways.

4. Every thing could go; success without things

Even granting this as a conceptual possibility, however, one sympathetic to Sider's line of thought might still reject a stuff ontology (and defend the orthodox countability thesis, as Olson does). And Sider, for his part, does offer another anti-stuff argument. It's a variant of the success argument for scientific realism, according to which the success of science is best explained by the reality of that which is posited by scientific theories.⁸ As Sider tells the story, the reason for adopting a thing-ontology is

the power of modern logic that presupposes it. Quantificational logic since Frege has proved to be a powerful tool inside and outside of philosophy. Think of contemporary semantic research in linguistics, philosophical logic, or even mathematics. For that matter, think of the conceptual scheme or ordinary thought, which appears to model the world as a world of things. If humans have been so successful with thing-thinking, it takes a strong reason to make us give it up (2001: xviii).

One has to be careful to distinguish at least three kinds of success-claims here, however. One is that a certain model successfully explains human behavior, construed broadly to include thoughts and patterns of inferences. Another is that humans who use a certain model (either implicitly or explicitly) are successful at navigating the objective or mind-independent world. A third is that the success of those who use a certain model to navigate the mind-independent world is best explained by reality being the way the model represents the world as being. Now, we've already seen that Sider does not distinguish quantification from thing-talk. So the success of quantification in any of these three senses must also be distinguished from the success of thing-talk in any of these three senses. So

⁸ The argument is initially due to Putnam (1975: 73), and has been reformulated and defended in various ways since. See Chakravartty (2011: §2.1) for an overview and bibliography.

even if, for example, quantificational logic has proven a successful tool in modeling patterns of inference taken to be valid by humans, this has no evidential bearing on whether thing-talk has allowed humans to successfully navigate the mind-independent world, or, even if it has, whether we should therefore believe in the reality of things.

That being said, at the end of the quoted passage Sider does clearly intend at least one specific version of the different success claims laid out above. In particular he claims that our “conceptual scheme.. appears to model the world as a world of things”, and that we’ve been “successful with thing-thinking”. Obviously Sider takes this to warrant belief in a thing-ontology. The implicit corollary is a replacing thing-talk with stuff-talk would yield less success and thus be less deserving of a realist-construal.

In what does the success of thing-talk consist? Broadly speaking the success of science involves the ability to predict, explain, and manipulate the mind-independent world on the basis of scientific theories. (Or so I will assume; see Kukla 1998: 12 for elaboration.) One scientific theory is therefore more successful than another if one better predicts, explains, or allows for greater instrumental control or manipulation. I will also assume that success arguments for realism are themselves successful, broadly speaking: the theory which is more successful warrants realism about its posits.⁹ Presumably, then, the claim to be evaluated is that adopting a thing-ontology is warranted because thing-talk allows for better predictions, explanations, and instrumental control than stuff-talk.

But this is simply not the case. To show this I will adapt an insight of Hume’s. In Part 5 of his *Dialogues Concerning Natural Religion*, Hume’s character Cleanthes presents an argument from analogy for theism. In broad terms the analogy is this: just as the complexity and purpose of a ship suggests it must have been intelligently designed (by a shipbuilder), so

⁹ Though see Frost-Arnold (2010) and Mizrahi (2012) for recent criticisms of this inference.

too does the complexity and (apparent) purpose of the universe suggest it must have been intelligently designed. For the sake of argument Philo agrees the analogy does support theism (the existence of a divine being). He denies, however, that the argument supports *monotheism* (the existence of a unique or singular divine being). Just as many tradesman and builders are involved in the construction and design of a ship, Philo reasons, so too might many gods be involved in the construction and design of a universe. So the design argument for monotheism needs more than the shipbuilding analogy.

From this point Hume treats as an open question whether the divine attributes required for designing a universe (e.g. wisdom and omnipotence) should be ascribed to a single divine being, or many. Philo then asks: “by what phenomena in nature can we pretend to decide the controversy?” As part of his answer he claims

Where we see a body raised in a scale, we are sure that there is in the opposite scale, however concealed from sight, some counterpoising weight equal to it; but it is still allowed to doubt, whether that weight be an aggregate of several distinct bodies, or one uniform united mass [Part 5 D 5.9].

Philo then claims that if one had never seen the measured quantity inhering in a single body, one should infer that a heap of distinct bodies sit on the opposite scale rather than a single united mass (the implication being that the analogical argument supports polytheism over monotheism). But it is the previous step that is important here. Suppose one sees only one side of a scale balanced at 5 kg. Despite being unobserved one could know (infer) that 5 kg rests on other side as well. Even so Philo points out one would not know whether on the other side there is a single 5 kg weight or five 1 kg weights, or any other combination. More generally one could know the (unobserved) *quantity* of weight without knowing the *number* of objects possessing that weight. So this scenario supports one version of a success argument but not another. The balanced scale warrants the inference from an observed 5 kg to an unobserved 5 kg. So the posit of 5 unobserved kg would be warranted as successful insofar

as it allowed one to predict that, or explain why, the scale remains balanced. But as it stands there is no success argument for there being one 5 kg weight rather than five 1 kg weights, or any other possible combination yielding 5 kg. The number of objects, as opposed to the quantity of weight, is underdetermined.¹⁰

Now here's the crucial move. It's not only the number of objects that is underdetermined here: so too is whether there are any (countable) objects or things at all, as opposed to uncountable stuff. After all, on the scale might also sit 5 kg of homogenous and infinitely divisible matter. So Hume's scale-balancing argument suggests the following more general principle: the instantiation of a measurable physical property (quantity or magnitude) may underdetermine not only the number of discrete objects possessing that property, but whether there are any discrete countable objects at all, as opposed to uncountable stuff.

Nothing in this argument is specific to weight, so it is easy to extrapolate. The instantiation of many if not all quantitative physical properties, such as mass or volume or voltage, need not determine a specific number as the number of objects possessing those properties. Their (possibly cumulative or additive) values could be possessed by different combinations of countably distinct things, or by infinitely divisible stuff, with no discernible difference. Even (quantized) properties that come in integer multiples need not necessarily do so. And it is not impossible that e.g. unit charge could be instantiated by an arbitrary and so strongly uncountable portion or stuff (or region of space), rather than a particularized electron. So consider a world in which at any given region varying quantities of physical magnitudes are instantiated, but in which there are no countably distinct things (compare Sider's mention of a world fundamentally consisting of the distribution of properties over

¹⁰ Of course Philo's case does not yield in principle underdetermination, insofar as there could be some way of observing what exactly is on the other side of the scale. Equally obviously, however, the scenario Philo describes can be adjusted so as to yield genuine observational indiscernability and so in principle underdetermination (as will be discussed shortly).

spacetime).¹¹ Such a world could very well be nomologically well-behaved; there could be lawful regularities holding between the various magnitudes instantiated in the same region, as well as between regions. There is no reason science couldn't be successful in such a world. Predictions and explanations could be offered on the basis of nomological relations between physical magnitudes, and instrumental control would be achievable; the lack of countably distinct objects would not undermine human endeavor, scientific or otherwise. Thing-talk might not be harmful in such a world but it wouldn't be helpful. As with Philo's balanced scale, it is the quantity of weight that matters, not the number of objects possessing that weight. Now add countably distinct things to a variant of this world.¹² Is thing-talk now more successful? Can one gain e.g. greater instrumental control by enumerating objects rather than by measuring stuff? I cannot see why it would, and an appropriately generalized version of Philo's argument suggests it wouldn't. That thing-talk may not be harmful, however, might wrongly suggest that thing-talk is successful. A more careful comparison to stuff-talk, however, would fail to reveal a distinct advantage. So the success argument for a thing-ontology fails.

5. Conclusion

I have argued that existence without strong countability is a conceptual possibility. I have also suggested that a nomologically well-behaved world could contain strongly uncountable entities. Though I have not offered positive arguments for thinking our world is in fact like this, I have argued that some prominent arguments against the coherence or metaphysical possibility of such a world do not succeed. Existence without strong

¹¹ See also Horgan and Potrc (2000) for a similar ontology.

¹² Markosian (2015) defends of a mixed ontology containing both stuff and discrete objects.

countability is a coherent position deserving of further investigation.

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