

# Truthmakers and modality

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**Abstract** This paper attempts to locate, within an actualist ontology, truthmakers for modal truths: truths of the form  $\langle$ Possibly,  $p$  $\rangle$  or  $\langle$ Necessarily,  $p$  $\rangle$ . In Sect. 1 I motivate the demand for substantial truthmakers for modal truths. In Sect. 2 I criticise Armstrong’s account of truthmakers for modal truths. In Sect. 3 I examine essentialism and defend an account of what makes essentialist attributions true, but I argue that this does not solve the problem of modal truth in general. In Sect. 4 I discuss, and dismiss, a theistic account of the source of modal truth proposed by Alexander Pruss. In Sect. 5 I offer a means of (dis)solving the problem.

**Keywords** Truthmakers · Modality

Michael Dummett said that the problem of necessity is twofold: “what is its source, and how do we recognise it?”<sup>1</sup> While it is undoubtedly not how Dummett would have thought of things, I would understand the former question as asking about what part of our ontology truths of necessity hold in virtue of: what are the *truthmakers* for truths of the form  $\langle$ Necessarily,  $p$  $\rangle$ ? This paper will concern itself with the search for truthmakers for modal truths in general: when  $\langle p \rangle$  is necessary, what is it in the world that makes it true that  $\langle p$  is necessary $\rangle$ ; when  $\langle p \rangle$  is possible, what makes it true that  $\langle p$  is possible $\rangle$ ?

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<sup>1</sup> Dummett (1959), p. 327.

## 1 Truthmakers for necessary truths

The search for truthmakers for modal truths has not been much pursued, and some philosophers who are sympathetic to truthmaker theory in general have explicitly claimed that modal truths need no truthmakers. Why is this? I think two assumptions are generally made (albeit often implicitly): (i) that if  $\langle p \rangle$  is necessary then there need not be a truthmaker for  $\langle p \rangle$ , and (ii) that the modal truths are a subset of the necessary truths. Certainly this seems to be Mellor's reason for denying that truths of the form  $\langle \text{Possibly}, p \rangle$  have a truthmaker. He says<sup>2</sup>

Because the identity of a necessary proposition entails its truth, I cannot see why any other entity must exist to make it true. So, in particular, since any contingent proposition 'p' is *necessarily* contingent, I . . . see no need of a truthmaker for the necessary truth that p is contingent and hence that . . .  $\neg p$  is possible.

Generalised, the thought is that if  $\langle p \rangle$  is necessary then  $\langle p \text{ is necessary} \rangle$  is necessary, and likewise if  $\langle p \rangle$  is possible then  $\langle p \text{ is possible} \rangle$  is necessary, and hence neither of those propositions require truthmakers.

The argument relies on the correctness of the S5 system of modal logic: the system according to which a proposition has its modal status as a matter of necessity. But I am happy with that assumption. I will question instead the assumption that if it's necessary that p then there need be no truthmaker for  $\langle p \rangle$ .

Assuming (as I will be) that the truthmaker demand is not in general misguided, why would the demand for truthmakers go away when the truths in question are necessary? The general idea, I take it, is that we don't owe an explanation for why things are such that p, given that there was no other option. If things *had* to be such that p, then there is no need to explain why the actual world turns out to be a p-world.

That a demand for grounding vanishes when the truth in question is necessary is a familiar thought. Consider the old debate as to why there is something rather than nothing: it has often been thought that if there simply *had* to be something rather than nothing then there is no need for there to be some explanation as to why there is something. Why is there something rather than nothing? Well, there was no other way for things to be.

I don't think this gives us any reason at all to deny that necessary truths have truthmakers. It seems that when we demand an explanation for why there is something rather than nothing we are doing something very different from asking in virtue of what part of ontology is there something rather than nothing.<sup>3</sup> This last question is really easy to answer: *every* thing makes it true that there is something rather than nothing. For all x, x is a truthmaker for  $\langle \text{something exists} \rangle$  (since every thing is a truthmaker for the proposition that it itself exists). But the puzzle of existence cannot be answered so easily: pointing to the existence of some thing will not satisfy one who is puzzled as to why there are any things. It seems clear, then, that the demand for an explanation for why there is something rather than nothing is not the same as asking

<sup>2</sup> Mellor (2003), p. 213.

<sup>3</sup> I am rejecting, then, accounts which identify the demand for truthmakers with a demand for explanation, such as that offered by Liggins (2005) (who cites Ian McFetridge as inspiration in this regard).

what the *ontological ground* is for there being something rather than nothing—the former question is an epistemic one, the latter metaphysical—hence we are not entitled to infer from the fact that, in general, the demand for explanation seems to vanish when that which is up for explanation is shown to be necessary that the demand for an ontological grounding for  $\langle p \rangle$  vanishes when  $\langle p \rangle$  is shown to be necessary.

Here is another motivation to accept truthmakers for modal truths if you accept truthmakers at all. It is natural, although not obligatory, for the truthmaker theorist to accept a correspondence theory of truth: that what it is for a proposition to be true is for the proposition to correspond to that part of the world that suffices for its truth—i.e. its truthmaker. But if you think that the necessary truths don't have truthmakers then you cannot say that this is what it is for a proposition that is necessarily true to be true. In that case you must accept a dual theory of truth: what it is for some propositions to be true is not what it is for other propositions to be true. This is unattractive.<sup>4</sup>

Still, one might resist the thought that modal truths need *substantive* truthmakers. Even if one accepts that the necessary truths must have truthmakers, one might be tempted to give a deflationary story about the way in which they are made true. The thought would be that the necessary truths *are* indeed made true, but they are made true “by default”: there are no substantial truthmakers for the necessary truths. One potential motivation for thinking that necessary truthmakers are grounded by default is if you think that it is a sufficient condition for  $x$  to be the truthmaker for  $\langle p \rangle$  that the existence of  $x$  necessitates the truth of  $\langle p \rangle$ . In that case every thing is a truthmaker for every necessary truth: it is vacuously true that the existence of  $x$  necessitates the truth of  $\langle p \rangle$ , when  $\langle p \rangle$  is necessary; there are no possible circumstances in which  $x$  exists and  $\langle p \rangle$  is false, because there are no possible circumstances in which  $\langle p \rangle$  is false.

But while I am happy to accept the orthodox position that it is a *necessary* condition for  $x$  to be the truthmaker for  $\langle p \rangle$  that the existence of  $x$  necessitates the existence of  $\langle p \rangle$ , I am not prepared to accept that it is a sufficient condition. Indeed, with another plausible assumption this principle leads us into the absurd position that every object is a truthmaker for every truth.<sup>5</sup> The other assumption is what Greg Restall calls the disjunction thesis: that if a thing (or some things) makes a disjunction true then it makes true one of the disjuncts. This is a plausible sounding thesis:<sup>6</sup> a disjunction can't be true without one of the disjuncts being true, and so it would seem that any thing that sufficed for the truth of a disjunction must also suffice for the truth of at least one of its disjuncts. But now consider some contingently true proposition  $\langle p \rangle$ . It is necessary that either  $\langle p \rangle$  is true or that  $\langle \neg p \rangle$  is true. By the assumption currently under attack, then, every thing is a truthmaker for the disjunction  $\langle p \vee \neg p \rangle$ . In which case it follows, by the disjunction thesis, that every object makes one of  $\langle p \rangle$  or  $\langle \neg p \rangle$  true. But no object makes  $\langle \neg p \rangle$  true, because  $\langle \neg p \rangle$  is false. So every object makes  $\langle p \rangle$  true.  $\langle p \rangle$  was an arbitrary contingent proposition, so every object

<sup>4</sup> I owe this argument to David Armstrong. Armstrong has taken to calling those who accept that some but not all truths have truthmakers ‘dualists’ about truth, hoping that the epithet will prove suitably embarrassing to them. See [Armstrong \(2006\)](#), p. 245.

<sup>5</sup> The argument in this paragraph is from [Restall \(1996\)](#).

<sup>6</sup> Although see [Read \(2000\)](#) for a dissenting voice.

makes every contingent proposition true. Since the only remaining true propositions are the necessary truths, the sufficiency assumption entails that every thing is a truthmaker for every true proposition. I am happy to take this as a *reductio* of the view that it is a sufficient condition for  $x$  to be the truthmaker for  $\langle p \rangle$  that the existence of  $x$  necessitates the truth of  $\langle p \rangle$ .

So we should abandon the claim that it is a sufficient condition for  $x$  to be the truthmaker for  $\langle p \rangle$  that the existence of  $x$  necessitates the truth of  $\langle p \rangle$ ,<sup>7</sup> and with this view ruled out I see no reason to hold that the necessary truths are made true by default. This means, given my argument above that the necessary truths require truthmakers as much as contingent ones do, that we must look for substantial truthmakers for the necessary truths. And so even if truths of the form  $\Box p$  or  $\Diamond p$  are necessary, we must look for substantial truthmakers for them.

However, our task is made easier by the following. In a search for truthmakers for modal truths, we will succeed if we manage to locate truthmakers *either* for truths of necessity *or* for truths of possibility since, given the duality of the modal operators, *lack* of a truthmaker for  $\langle \text{Possibly}, p \rangle$  or  $\langle \text{Necessarily}, p \rangle$  entails the truth of  $\langle \text{Necessarily}, \neg p \rangle$  or  $\langle \text{Possibly}, \neg p \rangle$  respectively. That is, if we manage to locate the truthmakers for truths of the form  $\langle \text{Possibly}, p \rangle$ , we can conclude that the truthmaker for  $\langle \text{Necessarily}, p \rangle$  is whatever makes it true that there is *no* truthmaker for  $\langle \text{Possibly}, \neg p \rangle$ . Likewise, *mutatis mutandis*, if we manage to locate truthmakers for truths of necessity: we can conclude that  $\langle \text{Possibly}, p \rangle$  is made true by the same thing that makes  $\langle \text{There is no truthmaker for } \langle \text{Necessarily}, \neg p \rangle \rangle$  true.<sup>8</sup>

## 2 Armstrong on truthmakers for modal truths

My goal is to locate among the ontology of the *actual* those objects which make modal truths true, for I believe the ontology of the actual exhausts what there is. I will not be arguing for this actualist thesis here, I will simply assume it. I am discounting, then, possibilist accounts of the source of modal truth, such as David Lewis' modal realism.<sup>9</sup>

Locating actual truthmakers for modal truths is a daunting task. As Ted Sider says, "Whether something *is* a certain way seems unproblematic, but that things might be otherwise, or must be as they are, seems to call out for explanation."<sup>10</sup> The reason for this is that modal facts "point beyond themselves"<sup>11</sup> in the same way that tensed or dispositional facts do. Just as it is difficult to see how presently existing things could account for facts concerning the past or future, it is difficult to see how actually existing things could account for facts concerning what might or must have been;

<sup>7</sup> If it's necessary but not sufficient for  $x$  to be a truthmaker for  $\langle p \rangle$  that the existence of  $x$  necessitate the truthmaker for  $\langle p \rangle$ , what more is needed? We'll come back to this question in Sect. 3.

<sup>8</sup> This relies on the truth of Truthmaker Maximalism: the principle that every truth has a truthmaker. I have defended this principle in Cameron (2008, forthcoming b).

<sup>9</sup> Lewis (1986). I argue against Lewisian realism in my Cameron (2007).

<sup>10</sup> Sider (2003), p. 184.

<sup>11</sup> *Ibid.* p. 185.

but while many of us are happy to accept the truthmaker argument for the existence of non-present entities, there is more resistance to the analogous argument for the existence of mere possibilia.

David Armstrong, both an actualist and a truthmaker theorist, has recently offered us a proof that there are truthmakers for truths of the form  $\langle \text{Possibly}, p \rangle$  among the ontology of the actual. He argues that we need only be concerned with truths of mere possibility, since he thinks that when  $\langle p \rangle$  is true, the truthmaker for  $\langle p \rangle$  also makes it true that  $\langle p \rangle$  is possible. He then goes on to argue that when  $\langle p \rangle$  is merely possible (i.e. possible but false), the truthmaker for  $\langle \neg p \rangle$  is a truthmaker (but not necessarily a *minimal* truthmaker) for  $\langle \text{Possibly}, p \rangle$ . His argument runs as follows.<sup>12</sup>

- 1) A makes  $\langle p \rangle$  true (Assumption)
- 2)  $\langle p \rangle$  is contingent (Assumption)
- 3)  $\langle p \rangle$  entails  $\langle \diamond \neg p \rangle$  (From 2)
- 4) If A makes  $\langle q \rangle$  true and  $\langle q \rangle$  entails  $\langle r \rangle$  (Assumption)  
then A makes  $\langle r \rangle$  true
- 5) A makes  $\langle \diamond \neg p \rangle$  true (From 1, 3 and 4)

If this argument is sound it establishes that what makes it true that  $p$ , for some contingent proposition  $\langle p \rangle$ , is also what makes it true that  $\langle p \rangle$  could have been false, i.e. that it is possible that  $\neg p$ .

Now clearly one could reject the legitimacy of the assumption at 1, which relies on truthmaker maximalism—the doctrine that *every* truth has a truthmaker. If maximalism is false the most one could get from an argument like this is that *some* truths of mere possibility have actual truthmakers. Other truths, for example the truth that there could be talking donkeys, will be left unaccounted for since, in all probability, the denier of maximalism will also deny the claim that there is a truthmaker for the fact that there are no talking donkeys (since problems in locating truthmakers for negative existentials are one of the most cited reasons for abandoning maximalism). Likewise, Armstrong uses this argument to account for the possibility of alien entities (particulars, properties and relations that are not combinatorially constructible from actual entities) by noticing that the truthmaker for the fact that all the actual things are *all* the actual things will be a truthmaker for the possibility of aliens.<sup>13</sup> But this move, of course, requires the existence of totality facts which, again, the denier of maximalism will likely reject. I, however, accept maximalism, so I will not press this point.

Let me also pause to object to the entailment assumption (at step (4)). Suppose  $\langle p \rangle$  and  $\langle q \rangle$  are both true. Armstrong claims that the truthmakers for  $\langle p \rangle$  and  $\langle q \rangle$  are the truthmakers (but not necessarily the minimal truthmakers) for the conjunction  $\langle p \& q \rangle$ , and indeed the disjunctions  $\langle p \vee r \rangle$ ,  $\langle q \vee r \rangle$ ,  $\langle (p \& q) \vee r \rangle$  etc, and any other proposition whose truth is entailed by  $\langle p \rangle$  and  $\langle q \rangle$ . I don't find this intuitive at all. Isn't the reason  $\langle p \& q \rangle$  is true because  $\langle p \rangle$  is true and because  $\langle q \rangle$  is true *and* because of the nature of conjunction?

<sup>12</sup> Armstrong (2004, p. 84) 'A' and ' $\langle p \rangle$ ' are to be read as schematic: arbitrary names for a thing and a proposition, respectively. I have changed the presentation of the argument, but it remains the same as Armstrong's in essentials.

<sup>13</sup> Armstrong (2004, pp. 86–89).

Now you might object: but the nature of conjunction is not a contingent matter, it doesn't need to be taken into account when accounting for the truth of  $\langle p \& q \rangle$ . But of course I reject that thought for the reasons given above, and Armstrong also rejects it. Just because it is necessary that when  $\langle p \rangle$  and  $\langle q \rangle$  are true  $\langle p \& q \rangle$  is true, this doesn't mean that this truth can go ungrounded. There must be a truthmaker for the proposition that  $\langle p \& q \rangle$  is true given that  $\langle p \rangle$  and  $\langle q \rangle$  are both true, in which case what makes it true that  $p \& q$  is not just what makes it true that  $p$  and what makes it true that  $q$ , but rather these things together with whatever makes it true that  $\langle p \rangle$  and  $\langle q \rangle$  entails  $\langle p \& q \rangle$ : perhaps the function that is conjunction.

But even granting both truthmaker maximalism and the entailment assumption, Armstrong's argument does not work. It is step 3 that is worrisome. Armstrong says that 3 follows from 2 and "the nature of the contingency of propositions."<sup>14</sup> Well it certainly follows from the fact that  $\langle p \rangle$  is contingent that  $\langle \neg p \rangle$  is possible, but that is not what is being said at 3; what is being said is that it follows from  $\langle p \rangle$ —the proposition itself, rather than the fact that it is contingent—that  $\langle \neg p \rangle$  is possible. And it is necessary that it is this claim that is being made, of course, for the application of the entailment principle (4); it must be  $\langle p \rangle$  that entails the possibility of  $\langle \neg p \rangle$ , not simply the fact that  $\langle p \rangle$  is contingent, since it is  $\langle p \rangle$ , and not the fact that  $\langle p \rangle$  is contingent, that we know has an actually existing truthmaker.

But does  $\langle p \rangle$  entail that  $\langle \neg p \rangle$  is possible? Armstrong says that "Given the attractive S5 modal system, if  $\langle p \rangle$  is contingent, it is a necessary truth that it is contingent. This may help to quell any doubts one may have about step 3 in the argument."<sup>15</sup> This is extremely odd. If S5 is true and entailment is classical then step 3 is justified; but then the above proof is not needed. Simply from step 4 we can prove that every thing that is a truthmaker for any truth is a truthmaker for truths of possibility, since truths of possibility are themselves necessary (in S5) and necessary truths are (classically) entailed by any set of formulae. Since every thing is a truthmaker for some proposition (a thing makes true the proposition that that thing exists, if nothing else) it follows that every thing makes truths of possibility true, since modal truths are entailed by all propositions. Armstrong, however, does not want the notion of entailment in the assumption at (4) to be classical, for he does not want to hold that necessary truths are made true by every thing.<sup>16</sup> He thinks, and I agree, that this is too easy a solution to the problem of necessary truths to be adequate. Indeed, the entailment assumption is utterly hopeless if entailment is classical and Restall's disjunction principle true: for  $\langle p \vee \neg p \rangle$  is classically entailed by anything, in which case every truthmaker, by the entailment assumption, makes true every instance of  $\langle p \vee \neg p \rangle$ , in which case, given the disjunction principle, every truthmaker makes true every truth; and we're back to the implausible claim that every object makes every truth true.<sup>17</sup>

Some kind of relevant entailment is required, then, in the formulation of the entailment principle at (4). But in that case, even if one believes S5 to be the correct system

<sup>14</sup> Ibid, p. 84.

<sup>15</sup> Ibid, pp. 84–85.

<sup>16</sup> Armstrong (2003), pp. 10–11.

<sup>17</sup> Thanks to an anonymous referee on this point.

of modal logic, this will not “quell the doubts” about step 3, for  $\langle p \rangle$  does not relevantly entail  $\langle \Diamond \neg p \rangle$ , no matter whether or not  $\langle \Diamond \neg p \rangle$  is necessary.<sup>18</sup> Armstrong cannot have his cake and eat it: if he wishes to appeal to relevant entailment then he is not justified in making the move from 2 to 3; he *is* justified in making this move if he wishes to appeal to classical entailment and S5, but at the cost of trivialising truthmakers for necessary truths.

Now in fact Armstrong had put forward a different version of the argument in an earlier paper which avoids this particular worry. That version ran as follows<sup>19</sup>

- 1) A makes  $\langle p \rangle$  true (Assumption)
- 2) A makes  $\langle p \text{ is contingent} \rangle$  true (Assumption)
- 3) A makes  $\langle p \text{ and } \langle p \rangle \text{ is contingent} \rangle$  true (From 1 and 2)
- 4)  $\langle p \text{ and } \langle p \rangle \text{ is contingent} \rangle$  entails  $\langle \Diamond \neg p \rangle$
- 5) If A makes  $\langle q \rangle$  true and  $\langle q \rangle$  entails  $\langle r \rangle$  (Assumption)  
then A makes  $\langle r \rangle$  true
- 6) A makes  $\langle \Diamond \neg p \rangle$  true (From 3, 4 and 5)

In this version of the argument 2 is not being said to follow from 1 but is an explicit assumption of the argument. Well, in this case I have no problem with the validity of the argument. Sure, if A makes it true that  $\langle p \rangle$  is contingent, and if the entailment principle is true, then A makes it true that  $\langle \neg p \rangle$  is possible. But I question Armstrong’s right to make the assumption at 2, for it seems simply to beg the question: if one doubts that the possibility of  $\langle \neg p \rangle$  obtains in virtue of A then it is not clear why one would be willing to accept that the *contingency* of  $\langle p \rangle$  obtains in virtue of A. The contingency of a true proposition *just is* the conjunction of its truth and the possibility of its negation. Now we know, *ex hypothesi*, that the truth of  $\langle p \rangle$  obtains in virtue of A; in that case isn’t the further claim that A also accounts for the contingency of  $\langle p \rangle$  simply tantamount to claiming that A also suffices for the possibility of the negation of  $\langle p \rangle$ ? But that is precisely what the argument is aiming to prove, so it can’t be presupposed by any premise without begging the question.

Armstrong offers the following rather obscure defence of premise 2:

A is something in the world, some state of affairs or other entity depending on just what truthmakers are postulated, a matter that depends on one’s whole metaphysics. Whatever A is, in the cases we are considering it is a contingent being. Could the contingency of A lie outside A? It does not seem possible. It cannot be a relation that A has to something beyond itself. So A is the truthmaker for the proposition  $\langle p \text{ is contingent} \rangle$ .<sup>20</sup>

This last “so” is completely beyond me! Certainly Armstrong must hold that A is a contingent being, given the contingency of  $\langle p \rangle$  and truthmaker necessitarianism—the claim that the existence of a thing necessitates the truth of any proposition it makes

<sup>18</sup> For the classic exposition of relevance logic see [Anderson and Belnap \(1975\)](#).

<sup>19</sup> *Ibid.*, p. 15. Again, the presentation is changed from Armstrong, but not in any way that affects the argument. Armstrong, in the later work, thanks Marian David for offering a simplification of this argument, so I suppose it is David that is to blame for the introduction of the particular problem noted above.

<sup>20</sup> *Ibid.* I have changed occurrences of ‘T’, which is what Armstrong names the truthmaker for  $\langle p \rangle$ , to ‘A’; I have not used ‘T’ because I want to avoid any possible confusion with a truth predicate.



true. The next point seems to be that A is the truthmaker for its own contingency: that is, that  $\langle A \text{ might not have existed} \rangle$  is true in virtue of A. Well that's not obvious, but even granting this how are we supposed to go from this to the claim that A is the truthmaker for  $\langle \Diamond \neg p \rangle$ ? It does not follow from the fact that the truthmaker for  $\langle p \rangle$  might not have existed that  $\langle p \rangle$  is contingent, for it may be necessary that there exists *some* truthmaker for  $\langle p \rangle$  even if it is not necessary that the actual truthmaker for  $\langle p \rangle$  exists. (Armstrong is not committed to, nor should one accept, the claim that if  $\langle p \rangle$  is made true by A then necessarily if  $\langle p \rangle$  is true it is made true by A.  $\langle \text{There is a human} \rangle$  is made true by many individuals, all of whom might not have existed and that proposition still have been made true.) So even if A makes it true both that p and that A might not have existed, we do not seem to have anything to suggest that A makes it true that  $\langle \neg p \rangle$  is possible; for all that has been said so far it may be that in all the worlds in which A does not exist there is some other thing that makes it true that p. And so the argument for premise 2 is unconvincing; all Armstrong can do is assume premise 2, which begs the question.

Armstrong's proof that the ontology of the actual suffices to ground the truths of possibility is unconvincing. Nor do I think we should accept his particular account of what in fact makes truths of possibility true. Armstrong accepts a combinatorial account of possibility. Consider the possibly true proposition  $\langle \text{There is a unicorn} \rangle$ .<sup>21</sup> Armstrong aims to account for this possibility combinatorially; what makes  $\langle \text{Possibly, there are unicorns} \rangle$  true, says Armstrong, just are actually existing things that are combinable to make a unicorn: say an actual horse and an actual horn. Of course we also need the truth that these actual things are combinable, since some actual entities are not, such as roundness and squareness. So what makes it true that these particular things—this horse and this horn—are combinable? No more than the horse and the unicorn themselves, says Armstrong, since their combinability is necessitated by their nature (while the non-combinability of roundness and squareness is necessitated by their nature).<sup>22</sup>

But even if this works in this particular case,<sup>23</sup> there are unacceptable limits to this combinatorial account of possibility. For a start, the possibility of aliens is left unaccounted for. By definition aliens are not the result of any combination of actual entities and so, since we have rejected Armstrong's suggestion that the truthmakers for claims concerning the possibility of aliens are totality facts concerning all the things there in fact are, this possibility is left ungrounded.

What of truths of necessity? Unfortunately, when dealing with necessity, instead of focussing on truths of the form  $\langle \text{Necessarily, } p \rangle$ , Armstrong turns his attention to truths of the form  $\langle p \rangle$  which happen to be necessary. When discussing possibility he considers propositions such as  $\langle \text{Possibly, there are unicorns} \rangle$ , but when discussing necessity he considers propositions such as  $\langle 7 + 5 = 12 \rangle$  when he should be considering propositions such as  $\langle \text{Necessarily, } 7 + 5 = 12 \rangle$ . But let us look at what he

<sup>21</sup> You might, following Kripke (1981, pp. 23–24, 157–158), deny that this proposition could be true. I find Kripke's reasoning unconvincing; but in any case, I will stick with Armstrong's example.

<sup>22</sup> Armstrong (2004), pp. 91–93.

<sup>23</sup> And that's far from obvious. As a referee put it to me: "a horse with a horn is a deformed horse, not a unicorn".



thinks the truthmaker for  $\langle 7 + 5 = 12 \rangle$  is, since it may shed light on the truthmaker for  $\langle \text{Necessarily}, 7 + 5 = 12 \rangle$ .

Armstrong offers two accounts of what makes  $\langle 7+5=12 \rangle$  true. On the simpler account, it is simply the numbers involved: 7, 5 and 12. Why? Because “Given the entities 7, 5 and 12, then they must, necessarily must, be related in this way [i.e. such that when you add the first two you get the last]. . . So (by the entailment principle) truthmakers for the existence of the entities should be a sufficient truthmaker for the necessary truth.”<sup>24</sup> Armstrong thinks that whatever makes it true that the numbers exist, namely the numbers, also makes true the truths of mathematics.

This opens the door to the claim that those numbers also make  $\langle \text{Necessarily}, 7 + 5 = 12 \rangle$  true. This can be justified in one of two ways. Firstly, we can appeal to the further two premises that (i) the numbers are themselves necessary existents and (ii) that any thing which exists necessarily makes it true that it exists necessarily. Or, secondly, we can follow Armstrong in his claim that all that is required for the truth of  $\langle 7 + 5 = 12 \rangle$  is the *possibility* of the existence of the numbers 7, 5 and 12. In that case, since it is plausible (given the characteristic axiom of the B system of modal logic<sup>25</sup>) that those numbers make it true that they necessarily could exist, they will also make it true that  $\langle 7 + 5 = 12 \rangle$  is necessary.

This attempt at grounding the truth of  $\langle \text{Necessarily}, 7 + 5 = 12 \rangle$  is heavily dependent on particular positions in the philosophy of maths. If you incline towards a kind of structuralist view whereby the truths of mathematics depend on there being entities that are numbers, but you hold that different sequences of entities can play the role of the numbers in different possible worlds, then nothing like Armstrong’s account can work, for we will be left seeking a grounding for  $\langle \text{Necessarily}, \text{some entities play the numbers role} \rangle$ . But more importantly, it’s far from clear how Armstrong’s view is meant to generalise to necessary truths that do not appear to be about the properties of a domain of necessary existents, such as, for example,  $\langle \text{Necessarily}, \text{for any collection of things, there is a mereological sum of those things} \rangle$  or  $\langle \text{Necessarily}, \text{there are impure sets iff there are concrete objects} \rangle$ .<sup>26</sup> And so I conclude that Armstrong’s attempt to locate truthmakers for modal truths among actuality is unconvincing.

### 3 Truthmakers, essence and modality

In Sect. 2 I argued that, while necessary, it is not sufficient for an entity  $e$  to be a truthmaker for a proposition  $\langle p \rangle$  that  $\langle p \rangle$  is true in every world in which  $e$  exists. What more is needed then? I suggest we make appeal to the notion of essence. Since the work of Fine (1994), the idea that essence is finer grained than *de re* modality has become very credible. While Socrates couldn’t exist without being a member of the singleton {Socrates}, it is not of Socrates’ *essence* to belong to any set. While you and I could not exist without being distinct, it is not of the essence of either of us that we be distinct from the other. Similarly, while I couldn’t exist and  $\langle 2 + 2 = 4 \rangle$  be false,

<sup>24</sup> Ibid, pp. 98–99.

<sup>25</sup> B:  $p \rightarrow \Box \langle p \rangle$ .

<sup>26</sup> C.f. my objection to Fine at the end of the next section.

I do not think that makes me a truthmaker for that proposition, precisely because it is not of my essence that any mathematical proposition be true; whereas it is of my essence that I be human, and hence I am a suitable truthmaker for the proposition that I am human.

What makes essentialist attributions themselves true? The hopeful thought is that it is simply A itself that makes it true that A is essentially F. For if it is otherwise, trouble looms. Suppose A makes it true that p. What makes it true that A makes it true that p? We really want to answer that it is A that makes this true, otherwise we appear to be off on an infinite regress. If it is not A, but rather some thing B, that makes it true that A makes it true that p, then what makes it true that B makes this true? If not B, but some other thing C, then what makes it true that C makes it true that B makes it true that A makes it true that p? If not C then . . . And so on, ad infinitum.

So we want to secure, if we can, the claim that whenever A makes it true that p, A is the truthmaker for  $\langle A \text{ makes it true that } p \rangle$ . A makes it true that p in virtue of having the essential properties it in fact has; so it seems that we can only secure the thought that A makes  $\langle A \text{ makes it true that } p \rangle$  true if A also makes it true that A has the essential properties it has. That is, that for all of A's essential properties F, A makes true the proposition  $\langle A \text{ is essentially } F \rangle$ .

But this view is not without its problems: there are arguments in the literature to the effect that A could exist and have different properties as its essential properties. Consider cases of objects with 'variable essences' in the following sense: that it is essential to them that they have some sufficient number of a certain set of properties, but that it is not essential to them that they have all the properties in that set. Nathan Salmon,<sup>27</sup> for example, asks us to consider a ship, S, built of 100 planks of wood, call them  $P_1$  to  $P_{100}$ . The ship could survive the loss of some of its parts, so it is not essential to S that it is built from  $P_1$  to  $P_{100}$ , but it couldn't have been built, thinks Salmon, from *completely* different planks. A ship built from planks  $P_{101}$  to  $P_{200}$ <sup>28</sup> would not be the very ship S, but some other ship. If he is right then S has the property 'has  $P_1$  as a part, or has  $P_2$  as a part, or . . . or has  $P_{100}$  as a part' essentially: there is no world in which S exists and lacks this property. And this is not only de re necessary of the ship, but essential to it, because if it did not have any of those planks as a part it would not be the very ship S.

If the hopeful thought is true then, S must make it true that S has this property essentially, in which case there must be no possible situation in which S exists and it be possible that S have none of  $P_1$  to  $P_{100}$  as parts. But this is not obviously the case; for consider a world  $w_1$  in which S has some different parts, say  $P_1$  to  $P_{97}$  and  $P_{101}$  to  $P_{103}$ . What are the essential properties of S in this world? Is it essential to S that it has either  $P_1$  as a part, or has  $P_2$  as a part, or . . . or has  $P_{100}$  as a part, or is it essential to S that it has either  $P_1$  as a part, or has  $P_2$  as a part, or . . . or has  $P_{97}$  as a part, or has  $P_{101}$  as a part . . . or has  $P_{103}$  as a part? There is some pressure to say the latter. For it seems that the planks that S could have been made from in a world are determined by the planks that it is made from *in that world*, not the planks it is

<sup>27</sup> Salmon (1981), pp. 230–240.

<sup>28</sup> Let us assume for simplicity that each plank has only one name, and so we know that  $P_{101}$  is distinct from  $P_1$ , etc.

actually made from. Why would the essence of *S* in  $w_1$  have anything to do with the planks  $P_{98}$ ,  $P_{99}$  and  $P_{100}$  when these planks are not parts of *S* in  $w_1$ ? But if the planks that *S* could have been made from in a world depend on what it is made from in that very world, and not what it is made from in the actual world, then we are going to be able to construct a series of possible worlds the last of which is one in which *S* exists and does not have the property ‘has  $P_1$  as a part, or has  $P_2$  as a part, or . . . or has  $P_{100}$  as a part’ essentially (although it will still have that property in that world). In that case, *S* cannot be the truthmaker for  $\langle$ It is essential to *S* that it has  $P_1$  as a part, or has  $P_2$  as a part, or . . . or has  $P_{100}$  as a part $\rangle$  since *S*’s existence does not necessitate the truth of this proposition.

How should we respond? I think the hopeful thought—that whenever a thing is essentially some way, it itself is the truthmaker for the proposition that it is that way essentially—is so advantageous and intuitive that holding onto it is worth denying the admittedly intuitive thought that what is essential to a thing in a world  $w$  is determined by how that thing is *in w* rather than how it actually is. I suggest that we accept that even had *S* been made of the planks  $P_1$ – $P_{97}$  and  $P_{101}$ – $P_{103}$  *S* it would have been essential to *S* that *S* be composed of a sufficient number of  $P_1$ – $P_{100}$ , since those are the planks *S* is *actually* made from.<sup>29</sup> I am advocating privileging actuality in a certain way, then, that would be abhorrent to the Lewisian realist about worlds, but is hopefully not so unattractive to the actualist.

We have our answer as to what makes it true that some thing is essentially some way: it is the very thing itself that makes this true. Essentialist attributions are made true by the actual objects they concern. What of *de re* modal propositions? It is overwhelmingly plausible that when essence and *de re* modality coincide, the propositions have the same truthmaker: so when *a* is essentially *F*, not only does *a* make it true that *a* is essentially *F*, *a* also makes it true that *a* couldn’t exist and fail to be *F*. The tricky case is when essence and *de re* modality diverge: what makes it true that *a* is necessarily *F* when *a* is not essentially *F*?

It seems likely that whenever *a* is necessarily *F* but not essentially *F* there is some other thing that is essentially such that *a* is *F*, and which would therefore be a suitable truthmaker for  $\langle$ *a* is necessarily *F* $\rangle$ . So, for example, in the case of Socrates and his singleton, while Socrates is not essentially a member of his singleton, his singleton is essentially such that Socrates is a member of it, and hence is a suitable truthmaker for  $\langle$ Socrates is necessarily a member of {Socrates} $\rangle$ ; while neither you nor I are essentially distinct from the other, our mereological sum essentially has us as distinct parts, and so is a suitable truthmaker for the fact that we are necessarily distinct.

So it looks not unreasonable to hope that in providing an ontological grounding for claims of essence, we succeed in providing an ontological grounding for all claims of *de re* necessity. But what of *de dicto* modal truth? What in actuality gives grounding to the fact that certain false propositions might have been true, or that certain true propositions couldn’t have been false? Having had such success with essence, we might wish to reduce modality *de dicto* to truths concerning essence, thereby locating the

<sup>29</sup> There is precedent for such a view; see [Roca Royes \(2006\)](#). Note that this view lets us avoid Salmon’s objections to the characteristic axiom of  $S4$  ( $\Box p \rightarrow \Box \Box p$ ) (ibid.), which rely on the thought that the essential properties of a thing in  $w$  are determined by the constitution of that thing in  $w$ , not its actual constitution.

source of all modal truth in the essence of what there actually is. This project would be in the spirit of Fine (1994), who wishes to locate the source of all de dicto necessary truths among the essences of all the (actual) things. He says

Certainly, there is a connection between the two concepts [essence and modality]. For any essentialist attribution will give rise to a necessary truth; if certain objects are essentially related then it is necessarily true that the objects are so related . . . the resulting necessary truth . . . is true in virtue of the objects in question; *the necessity has its source in those objects which are the subject of the underlying essentialist claim.*<sup>30</sup>

[W]e should view metaphysical necessity as a special case of essence. For each class of objects . . . will give rise to its own domain of necessary truths, the truths which flow from the nature of the objects in question. *The metaphysically necessary truths can then be identified with the propositions which are true in virtue of the nature of all objects whatever.*<sup>31</sup>

But Fine has only argued that essence gives rise to metaphysical necessity, he has not given us any reason to think that *every* metaphysically necessary truth arises from some truth concerning the essence of some thing(s), he merely assumes it. And it seems highly dubious to me that all the metaphysically necessary propositions have their source in some essentialist attribution. Consider, for example, the truth <Necessarily, if there is a thing, there is the singleton of that thing>. In virtue of what is this true? I am at a loss to identify some actual thing whose essential properties account for this truth. For this necessary truth does not speak about the actual things in the world—it does not say that for all x, necessarily, if x exists then the singleton of x exists; rather, it says that *no matter* what had existed, each thing would have had a singleton. And so none of the actual singletons, or their members, seem to ground this necessary truth.

#### 4 Modality, powers and God

Alexander Pruss<sup>32</sup> has recommended an account of the source of modal truth that is Aristotelian in its inspiration but which relies on the existence of God. The Aristotelian thought is that substances come ready made with certain capacities. My wife and I, for example, have the power to beget a child; an acorn has the power to grow into a tree. Now suppose my wife and I never actually have a child, and that the acorn in fact never grows into a tree. Nevertheless, we could have a child, and the acorn could have grown into a tree. So the combined powers of my wife and me, and the powers of the acorn, seem, on the face of it, to account for the de dicto possibilities that there could have been more people than in fact there are, and that there could have been more trees, respectively. These possibilities appear to be grounded in our capacities: that is, the truthmaker for the proposition that these situations are possible seems to be simply me

<sup>30</sup> Fine (1994), pp. 8–9.

<sup>31</sup> Fine (1994), p. 9.

<sup>32</sup> Pruss (2002).

and my wife, together with our powers, and by the acorn and its powers, respectively. These powers are actually existing entities, so we have located truthmakers for some de dicto modal claims among the ontology of the actual. The problem is that even if you are prepared to buy into the Aristotelian idea that substances have certain powers which ground certain possibilities, there are certain situations which are intuitively possible but which don't look to be grounded by the powers of any substance.

Intuitively, I am a contingent being—I might not have existed. What, for the Aristotelian, grounds this possibility? Presumably, it is my parents; for just as it was within their power to beget me, it was also within their power not to, and had they exercised the latter power I would not have existed. And the truthmaker for the truth that my parents might not have existed is, in turn, their parents. But what about the highly intuitive possibility that *none* of the actual contingently existing substances existed—what is the truthmaker for the truth that this situation is possible?<sup>33</sup> It can't be any of the actual contingently existing beings, for none of these beings has the capacity to bring it about that it itself *never existed*. And there are other possibilities that the Aristotelian account looks hard pushed to ground, such as the possibility of there being different global laws of nature, or in general possibilities concerning how the world could have been globally.

But as Pruss points out, if there is a necessarily existing God, then we can appeal to God as the truthmaker for these recalcitrant possibilities. What grounds the fact that there could have been none of the actual contingently existing beings?—God grounds this fact, because it is within God's powers not to have created any of the contingent beings he actually created. Likewise, God could have created the world to run according to different laws, etc.<sup>34</sup>

What should we say about Pruss' theistic account of the source of modal truth? Many philosophers would no doubt reject it simply because it is a *theistic* account, and they do not accept the existence of God, but I don't want to rule it out so simply for two reasons. Firstly, the game we are playing allows that we admit into our ontology otherwise objectionable things on the grounds that the hypothesis that they exist has eminent utility, so even if you don't believe in God you should be open to the possibility that you should become a theist if the existence of God provides the best account of modal truth, just as Lewis wishes us to be open to the possibility that we should become believers in the plurality of worlds for the same reason. Secondly, it will be far more interesting if we can provide an *internal* objection to Pruss' account; i.e. a reason not to accept his theistic grounding of modal truth even on the assumption that God exists. That is what I will try to do: to show that even if there is a God it is not acceptable to ground modal truth in the powers of God.

Here is the worry. Pruss's account of the source of de dicto modal truth in general is this: if  $\langle p \rangle$  is possible, it is so in virtue of God's capacity to create a world in

<sup>33</sup> As Pruss points out, we must distinguish the allegedly possible situation under discussion from one in which there are *no* contingent beings. The possibility of the latter situation is a topic of much debate. For a critical survey of the issues see my Cameron (2006), but the possibility that none of the actual contingent beings exist is far less controversial.

<sup>34</sup> The account also offers a nice explanation for why God is a necessary existent. God is necessary precisely because, as powerful as He is, not even He could make it such that He never existed.

which  $\langle p \rangle$  holds; if  $\langle p \rangle$  is necessary, it is so in virtue of God's incapacity to create a world in which  $\langle p \rangle$  fails to hold. God's powers are what grounds what could and what must have been. Something is possible *because* God could have actualised it. But a traditional tenet of theism is that God is omnipotent – that anything that is possible is within his power—and this suggests that God could have actualised something *because* it is within the realm of possibility, not vice-versa.

This is an instance of the familiar Euthyphro contrast. Theists are mostly agreed that it is within God's power to create a world such that  $p$  if and only if it is possible for there to be a world such that  $p$ . But simply committing oneself to the (necessary) truth of the biconditional leaves the direction of explanation open: is it within God's power to create a  $p$ -world because  $\langle p \rangle$  is possible, or is  $\langle p \rangle$  possible because it is within God's power to create a  $p$ -world? In claiming God, with His powers, as the ground for modal truth Pruss commits himself to a situation being possible because it is within God's power.

Pruss's position regarding possibility is analogous to the divine command theorist's position regarding goodness. The divine command theorist holds that an action is good because God commands it (as opposed to God commanding it because it is good). This immediately leads to the following worries: (i) if God had commanded us to rape, the divine command theorist has us believe, it would have been good for us to commit rape. But this is counter-intuitive. (ii) the theist asserts that God's law is good, but if the divine command theorist is right, this is simply a trivial truth: it doesn't say anything substantial *about* God's law, because what it is to be good *just is* to be God's law.

Now there is perhaps no parallel to the first problem for Pruss that is worrying. The supposed problem for the divine command theorist seems to rely on the thought that rape is bad no matter what. If so, then the problem loses its bite if what God commands/approves of/forbids is essential to Him, for then the result that rape is bad no matter what is secured. Since God forbids rape no matter what, rape is bad no matter what. Who cares that rape would have been good had God, *per impossibile*, commanded us to rape? So it looks like there is only a problem for the divine command theorist if God could have commanded different things from what He actually commanded. Now whatever the plausibility of the claim that what God commands He commands essentially, the parallel essentialist thought in the modal case is very plausible: that God's powers are essential to Him. So while Pruss is committed to the counterfactual 'had it not been within God's power not to create George Bush, George Bush would have been a necessary existent' this does not seem troublesome: who cares what would have been the case had God's powers, *per impossibile*, been so limited? But the problem for Pruss that is analogous to the second of the problems for the divine command theorist does seem to me to be something the theist should be concerned about. The theist thinks herself to be saying something substantial about God when she claims He is omnipotent. But if Pruss is right, she is not; it is trivially true that God can do anything possible, since what it is to be possible *just is* to be something that God can do.

How should one sympathetic to Pruss's account respond to this worry? Well, how should the divine command theorist respond to the objection that according to them 'God's law is good' is trivially true? They should, I think, point out that their position

concerns solely the *source* of goodness, not the meaning of the term ‘good’. To claim that the truth of moral propositions holds in virtue of God’s commands is not to say that ‘good’ *means* ‘approved of by God’. Thus divine command theory is in no way committed to ‘what God commands is good’ being an analytic truth.<sup>35</sup> Compare the familiar response to Moore’s open question argument on behalf of the ethical naturalist: it doesn’t follow from goodness being  $\Phi$ -ness that ‘is goodness  $\Phi$ -ness?’ is a closed question, for it doesn’t follow from goodness being  $\Phi$ -ness that ‘goodness’ *means* ‘ $\Phi$ -ness’.<sup>36</sup> Likewise, it doesn’t follow from the fact that to be possible is to be within God’s power that ‘being within God’s power’ means ‘is possible’—we are concerned with the metaphysical grounding of the modal, not with giving an analysis of modal language—and so Pruss is not committed to the claim that ‘God is omnipotent’ is an analytic truth.

But even if ‘God is omnipotent’ need not be taken to be analytic, Pruss’ account still seems to make it trivial in an objectionable way. When the theist says that God could not make a square circle, or make a married bachelor, or make  $2 + 2$  equal 5, she does not tend to think of this as being any serious limitation on God’s powers precisely because such things are impossible, whereas on Pruss’s account they are impossible because they are beyond the limits of God’s powers. Indeed, some theists, including Descartes, have even wanted to claim that God can do the impossible. If Pruss is right Descartes’ view is a priori false, because what it is to be possible is simply for it to be within God’s power, but it seems to me that this should remain an open option for the theist. The option may not seem very appetising when we consider propositions such as <there is a round square>, but it may seem more so when we consider propositions such as <there is an abundance of unnecessary evil (i.e. evil that is not for the purpose of some compensating good)>. The theist may well want to consider this proposition a necessary falsehood on the grounds that God exists necessarily and is essentially wholly good, omnipotent and omniscient. Since the existence of unnecessary evil appears to be incompatible with the existence of a wholly good, omnipotent, omniscient being, God’s necessary existence rules out even the possibility of unnecessary evil. Now, I’m not claiming the theist *should* think that: only that it would not be implausible for them to think that. But the theist who accepted this would probably not think herself thereby committed to it not being within God’s *ability* to create a world with unnecessary evil. God has the *power* to inflict evils on his creation that are not for the purpose of any greater good, but, necessarily, as a result of his goodness He will never use this power. There is a perfectly good sense, then, in which God can do the impossible: He has the power to bring about things that do not obtain in any possible world. Pruss’s account cannot accommodate the (epistemic) possibility of it being within God’s powers to do something which, as a matter of metaphysical necessity, He does not do; so, since it seems to me to be a perfectly sensible thing for the theist to believe, I don’t think even the theist should accept Pruss’s account.

There is another problem to Pruss’s view. It does nothing at all to illuminate modal epistemology, for discovering what is within God’s powers looks no easier than

<sup>35</sup> Cf. Adams (1979).

<sup>36</sup> For Moore’s open question argument see Moore (1903).



discovering what is possible. Divine knowledge is no less mysterious (perhaps more mysterious?) than modal knowledge. Pruss does not meet Peacocke's 'Integration Challenge': the demand to reconcile the metaphysics of a discourse with how we come to know (some of) the true propositions of that discourse.<sup>37</sup> I think this is a severe disadvantage of the account. It is not clear how we could even in principle know what God is capable of. That is, it's not clear how we could know that God is capable of making a world where *p* is true unless we relied on the inference from the possibility of *p* and God's omnipotence to it being within God's capacity to create a world where *p* is true. But, of course, such an inference gets things the wrong way round on Pruss' account: we should be inferring instead the possibility of *p* from it being within God's power that *p*.<sup>38</sup> My complaint then is that knowing what God is capable of is *only* possible if God's capabilities are dependent on what is possible; giving God's capabilities priority, as Pruss does, makes it a mystery what His capabilities are, and hence makes it a mystery what is merely possible or necessary.

## 5 Modality and naturalness

I have looked at a number of attempts to ground modal truth and found them wanting. But perhaps we are making the problem more difficult than it should be. There has been, so far, no mention of the Leibnizian biconditional:  $\langle \text{Necessarily, } p \rangle$  iff  $\langle p \rangle$  is true at all possible worlds; and I know of no actualist account of the source of necessity that makes serious use of this biconditional. On the face of it, that's strange. If truths of possibility are a kind of existential (*there is a possible world at which*  $\langle p \rangle$  is true) and truths of necessity a kind of negative existential (*there is no possible world at which*  $\langle p \rangle$  is false) then we might expect whatever story we tell regarding positive and negative existential claims elsewhere to help us in the modal case.

The problem for the actualist, of course, is that in order to account for the possibility of  $\langle p \rangle$  it is not sufficient merely to account for the existence of a world such that *p*: one must also account for the fact that this is one of the *possible* worlds, and not an impossible world. For the Lewisian realist, to be a world just is to be a possible world; there are no impossible worlds, and this is a result of the fact that modal truths are simply analysed in terms of what is true at a world. For the actualist, however, there will be impossible worlds in whatever sense that there are possible worlds. If for example, as I myself hold, worlds are sets of propositions, there will be sets all of whose members could not be true together just as there will be sets all of whose members could be true together. To account for the truth of the existential proposition  $\langle \text{There is a possible world at which } p \rangle$ , then, we need to account both for the existence of a world at which  $\langle p \rangle$  and for the possibility of this world. Accounting for the

<sup>37</sup> Peacocke (1999).

<sup>38</sup> A referee suggested that Pruss could hold that while facts about God's powers are *metaphysically* prior to facts about what is possible, the latter are epistemically prior to the former, so that it is still appropriate on Pruss's account to infer facts about what God could do from facts about what could be the case. Fair enough; but if Pruss takes this route the onus is on him to explain how we can have knowledge of modal facts without having prior knowledge of the facts that they, on his account, constitutively depend on.

existential is simple:  $\langle a \text{ exists} \rangle$  is made true by  $a$ . It is accounting for the possibility of the world that is hard.

I want to dissolve this problem rather than solve it. I think the problem of accounting for the possibility of the possible worlds rests on the assumption that the distinction between the possible worlds and the impossible worlds is a natural distinction, and I want to reject this assumption.<sup>39</sup>

Natural distinctions carve the world at its joints, unnatural distinctions do not. There is, plausibly, a natural distinction between the things that are red and the things that are not red, but there is no natural distinction between the things that are *grue*<sup>40</sup> and the things that are not *grue*. When there is a natural distinction between the  $F$ s and the non- $F$ s there is objective similarity between the  $F$ s, whereas two  $G$ s may be objectively very dissimilar if the distinction between the  $G$ s and the non- $G$ s is an unnatural one: two things need not resemble one another in any objective sense just because they share the property *being red or being a microwave oven*, and that is because the distinction between the things that are red or microwave ovens and the things that are neither is not a natural distinction—it does not carve the world at a joint.<sup>41</sup>

Whether or not the distinction between the  $F$ s and the non- $F$ s is a natural one has consequences for what is needed to make true the proposition that one of the  $F$ s *is* an  $F$ . There is pressure to believe in a property of red-ness to account for truths of the form  $\langle a \text{ is red} \rangle$ , but there is no pressure to believe in a property of *grue*-ness to account for truths of the form  $\langle a \text{ is grue} \rangle$ .  $\langle a \text{ is grue} \rangle$  is true not in virtue of the state of affairs of a being *grue*, but in virtue of the state of affairs of a being green, or the state of affairs of a being blue (whichever it is that exists) together with whatever makes it true or false that  $a$  was examined at  $t$ . The lesson is that when the distinction between the  $F$ s and the non- $F$ s is an unnatural one, an  $F$  is an  $F$  not in virtue of instantiating some unnatural property but in virtue of instantiating its natural properties. We need to admit into our ontology properties and/or states of affairs to ground things falling on either side of the natural divisions in the world, but once we have done that we get the facts concerning the unnatural divisions for free.

As I said, I think the worry about accounting for the possibility of the possible worlds rests on the assumption that there is a natural distinction between the possible worlds and the impossible worlds. Were there such a natural distinction it looks like we would need to admit the existence of some natural property—the property of representing a possibility—that is had by all and only the possible worlds, and this looks very unattractive. It's as if we're saying that some of the worlds come with a special glow—the glow of possibility—but we're not saying anything about what this glow is, or how we can detect it; and that's just bad metaphysics.

But what pressure is there to think that the distinction between the possible worlds and the impossible worlds is a natural one? Why should we think that our modal notions carve the world at its joints? No reason, I suggest. I recommend abandoning this assumption. There is nothing more to a world's being a possible world, I suggest,

<sup>39</sup> I draw here on my Cameron (forthcoming a).

<sup>40</sup> Something is *grue* iff it is either green and examined before time  $t$  or blue and not examined before time  $t$ . See Goodman (1954).

<sup>41</sup> For discussions of naturalness see, inter alia, Lewis (1983, 1986) and Sider (1993, 1995).

other than that it represents the actual laws of logic, the actual mathematical truths, the actual natural kind identities, etc.,<sup>42</sup> as being true, and that it doesn't represent as true anything that contradicts any of these truths.<sup>43</sup> In that case, to account for the fact that some world  $w$  is a possible world, we need only account for the fact that the actual truths concerning logic/mathematics/natural kind identity etc are represented as being true by  $w$ , and that nothing that is incompatible with any of these truths is represented as being true by  $w$ . So let  $S$  be the set of all and only the propositions that  $w$  represents as being true: whatever makes it true that  $w$  represents all and only the members of  $S$  as being true will also make it true that  $w$  is a possible world<sup>44</sup>—and it is plausible that this is merely  $w$  itself.<sup>45</sup>  $w$  is a suitable truthmaker for  $\langle w \text{ is a possible world} \rangle$ , then, since a possible world is possible solely in virtue of representing as true all and only the propositions it in fact represents as true. So  $w$  makes true both that  $p$  is true according to it and that it itself is a possible world; since the possibility of  $\langle p \rangle$  simply amounts to  $\langle p \rangle$ 's being true at some possible worlds, it follows that  $w$  makes true the proposition  $\langle \text{Possibly}, p \rangle$ .

The Leibnizian biconditional doesn't offer any hope for solving the problem of the source of modal truth if we think that there is something more to a world's being possible than that it represents as true the propositions it in fact represents as true, for in that case the problem is simply shifted to accounting for the world having this extra feature. I see no need to posit this extra feature. There is no natural distinction between the possible worlds and the impossible worlds—no 'glow of possibility'; the property of representing a possible maximal state of affairs is no more and no less than the highly unnatural property of representing as true the actual truths concerning

<sup>42</sup> I'm deliberately leaving it open here what exactly a world has to be like to count as possible because I want to separate my account of the *source* of necessity with any claim concerning the *extent* of necessity. All that I am committing myself to is that there is some list of true propositions such that a world is possible iff it represents all those propositions as being true, and that a possible world is possible solely in virtue of representing those propositions as being true. I am not even committing myself to the claim that such a list will be finitely statable. For my part, I believe that the list can be confined to the logical axioms; but here is not the place to defend that claim.

<sup>43</sup> This last conjunct is needed because there are impossible worlds where every necessary truth is true *and* some impossible truths are true as well, so we can't say that a world gets to be possible just by representing all the necessary truths as true. This means that we can't make do in what follows simply with finding a truthmaker for the fact that  $w$  represents as true all the necessary truths—we also need a truthmaker for the fact that  $w$  doesn't represent as true any impossibility. This will be taken care of if we can find a truthmaker for the fact that  $w$  makes all and only the members of  $S$  true; my claim is that  $w$  is this truthmaker.

<sup>44</sup> This relies on the thought that motivates the S5 system: that the modal status of a proposition isn't itself something that can change from world to world. As I said earlier, I find this very intuitive. The major reasons against accepting S5 seem to be the Salmon counterexamples to S4; but as we saw in Sect. 3, I resist those.

<sup>45</sup> There are various conceptions according to which it is plausible that  $w$  itself makes it true that  $w$  represent  $s$  all and only the members of  $S$  as being true. If worlds are sets of propositions, for example, a proposition  $\langle p \rangle$  is true according to  $w$  just in case  $\langle p \rangle$  is a member of  $w$ . Since sets have their members essentially,  $w$  will thus be a suitable truthmaker for  $\langle \langle p \rangle \text{ is a member of } w \rangle$  and hence for  $\langle p \text{ is true according to } w \rangle$ ; it will also, for the same reason, be a suitable truthmaker for  $\langle \neg p \text{ is not true according to } w \rangle$ . The claim is also plausible if one has a 'magical ersatzist' account of worlds (see Lewis (1986, pp. 174–191)). I don't want to commit myself to a particular ersatzist account of possible worlds here; the ontology one opts for at the end of the day will be driven by issues that cut across the present debate, such as the need to avoid the Cantorian paradoxes that lurk in this area.

logic, mathematics, natural kind identity, etc.<sup>46</sup> Once we've provided an ontological grounding for a world representing what it does, we get the modal facts for free: and all we need to ground the former is simply the worlds themselves.

So what makes  $\langle$ Possibly,  $p$  $\rangle$  true is just any of the possible worlds that represent  $\langle p \rangle$  as being the case, since all it takes for  $\langle p \rangle$  to be possible is that it is true at some possible world, and all it takes for a possible world to be possible is that it represents as true what it in fact represents as true, and worlds make true propositions concerning what they themselves represent. The ontology of abstract possible worlds is all we need to account for modal truth. And what makes  $\langle$ Necessarily,  $p$  $\rangle$  true? Whatever makes it true that there is no truthmaker for  $\langle$ Possibly,  $\neg p$  $\rangle$ ; and here we can appeal to whatever story we tell elsewhere concerning negative existentials.<sup>47,48</sup>

The problem has seemed harder than it is because of the assumption that there is some natural distinction between the possible and the impossible worlds. Such a distinction demands an ontological grounding, and this is what has proven difficult to give. But I can see no reason for supposing there to be such a natural distinction, and with the assumption rejected the problem of modal truth dissolves.

## 6 Conclusion

I have argued that the truthmaker for  $\langle$ Possibly,  $p$  $\rangle$  is simply any of the possible worlds that represents  $\langle p \rangle$  as being true, and that the truthmaker for  $\langle$ Necessarily,  $p$  $\rangle$  is simply whatever makes it true that there is no truthmaker for  $\langle$ Possibly,  $\neg p$  $\rangle$ . The latter is going to be whatever makes it true that all the possible worlds are *all* the possible worlds (and here we tell whatever story concerning negative existentials that we tell elsewhere).

And so we have a substantial account of modal truth—one that grounds modal truth without grounding it trivially (in the sense that modal truths are made true by any thing whatsoever). There is, then, no risk of our being committed to a dualism about truth: modal truths are true in the same sense that any other truth is true—for  $\langle p \rangle$  to be true is for it to correspond to the portion of reality that makes it true.

Providing an ontological grounding for modal truths has seemed harder than it in fact is because of the assumption that the divide between the possible and the impossible is a natural one: with this unwarranted assumption rejected, the problem of modal truth loses its intractability.<sup>49</sup>

<sup>46</sup> Cf. Sider (2003).

<sup>47</sup> I don't want to take a stand on what makes negative existentials true in this paper, although I do in Cameron (forthcoming b). For alternative accounts see Martin (1996) and Armstrong (1997, 2004).

<sup>48</sup> Perhaps you think we shouldn't *ever* posit truthmakers for negative existentials. Fair enough; in that case you should hold that only truths of possibility have truthmakers, and that truths of necessity are true simply because the corresponding truth of possibility lacks a truthmaker. There is only a pressure to locate truthmakers for both truths of possibility *and* truths of necessity if we accept truthmaker maximalism: the doctrine that *every* truth has a truthmaker. And if maximalism is accepted then we must have an account of the truthmakers for negative existentials in general: an account that we can then appeal to for the case of necessity.

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