TRUTHMAKERS FOR WHAT?

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Abstract

While taking truth to supervene on being, I argue that theories of truthmakers are theories neither of truth nor of meaning. Against the 'maximalist' view that all truths have truthmakers, I defend the 'moderate' view that only some propositions need truthmakers to make them true, with the truth values of other propositions following from those of these 'primary' ones. After saying what I think makes propositions primary, I conclude by showing how, on a moderate truthmaker theory, general truths need no truthmakers.

1. Introduction

My target in this talk is truthmaker *maximalism*, the thesis that *all* truths need truthmakers, which Charlie Martin (1996), David Armstrong (2003) and many other truthmaker theorists accept. I shall argue for the *moderate* truthmaker thesis that I share with John Heil (2000) and others on which, as Peter Forrest and Drew Khlentzos put it,

> only some truths, the *primary* ones, have truthmakers, while other truths and falsehoods are derivable from the primary truths by means of truth conditional semantics (Forrest and Khlentzos: 3).

I start from John Bigelow's (1988: 132) claim that 'truth supervenes on being' or, in a variant of David Lewis's (2003: 25) amplification of this, that what's true depends on *what* there is and *how* it is. This implies, for example, that all worlds where the proposition ⟨The earth is round⟩ – ⟨ER⟩ for short – is false must either *lack* our earth[2]– a difference in *what* there is – or their earth must not be *round* – a difference in *how* it is. I also follow Gonzalo Rodriguez-Pereyra (2005: 17) in holding that non-ER worlds of *both* kinds must differ from ours in the *truthmakers* they contain.

However, for moderate truthmaker theorists, this doesn't require our world to contain a *specific* truthmaker – for the proposition ⟨ER⟩ – that all non-ER worlds lack, since ⟨ER⟩ may not be a primary proposition, i.e. one that needs a truthmaker to make it true. But if ⟨ER⟩ *isn't*

[1] The immediate ancestor of this paper was discussed at a conference on 'Truth and Reality' held in January 2007 at the University of Otago, who met my considerable travel expenses. Remoter ancestors have been discussed from 2001 on at the Universities of Nottingham, Durham, London, Stirling, Melbourne and Cambridge, the Australian National University and the Universität Zürich. Repeated revisions of the paper owe much to these and other discussions. I am also indebted to the British Academy for a Research Grant to meet my expenses in travelling to and from the Australian National University in 2002 to work on truthmaker theory. A German translation of the paper's Zürich ancestor is published in (Mellor 2004).

[2] Or a counterpart of it (Lewis 1973: ch. 1.9)

primary, then its truth can only supervene on being if its truth value depends on that of *some* member of a class of primary propositions, at least *one* of whose truth values differs between our world and any given non-ER world. In short, truth can only supervene on being if *some* propositions are primary, even if ⟨ER⟩ isn't one of them.

2. Truthmaking and entailment

Next, for our supervenience thesis to be *serious*, truth*makers* must generally differ in kind from truth*bearers*, which we can mostly take to be *propositions*.[3] So whatever most truthmakers *are* – particulars, tropes, substantial facts – they mustn't be whatever *propositions* are – which for present purposes won't matter much provided, as we'll see, that they're not *sentences*.

In other words, since the truthmaker S of a true primary proposition ⟨P⟩ can't usually be another proposition, S's truthmaking relation to ⟨P⟩ must generally be what David Armstrong calls *cross-categorial* (2003: 13). But then, since *entailment* relations between propositions *aren't* cross-categorial, we can't identify truthmaking with the *entailment* of ⟨P⟩ by the proposition that S exists. To say *this* isn't of course to disparage entailment's role in transmitting truth from one proposition to another, merely to note that being entailed by other truths can't be what makes *primary* truths true.

3. Truthmaking and truth

Taking truthmaking to relate a truth ⟨P⟩ to a non-propositional entity S may make truthmaker theories look like correspondence theories of truth. But they're not. To say that some or all true propositions are *made* true by non-propositional entities isn't to say that this is what it *is* for them to be true. Take prime ministers. To say what *makes* someone a prime minister – commanding a parliamentary majority – isn't to say what it is to *be* a prime minister. To *be* a prime minister is to lead a government, however that comes about.

And as with prime ministers, so with truths: what *makes* a proposition true, and what it is for it to *be* true, are different questions, although of course their answers aren't entirely independent. Truthmaker theorists can't, for example, accept *identity* theories of truth that identify the *fact* that P with the true proposition ⟨P⟩ (Candlish 2005): that's clearly incompatible with the whole idea of truthmaking, that true propositions generally owe their truth to something else. Still, as correspondence and identity aren't the *only* tenable theories of truth, truthmaker theorists can reject both. All they need in fact is the relatively uncontentious *equivalence principle* (EP) that, for all non-paradoxical propositions ⟨P⟩,

[3] *Some* truthmakers may be propositions, as when a proposition ⟨A⟩'s being primary makes true the proposition ⟨B⟩ that ⟨A⟩ *is* primary. But even here ⟨B⟩ will never be identical to the proposition ⟨A⟩ that is, or is a constituent of, what makes ⟨B⟩ true.

(EP) ⟨P⟩ is true if and only if P.[4]

But if this equivalence principle tells us what it *is* for ⟨P⟩ to be true, it can't also tell us what *makes* ⟨P⟩ true. Take apparent truths like ⟨Murder is wrong⟩, or ⟨Neutrinos have no charge⟩, that *seem* to be about values or theoretical entities. Believers in values and neutrinos may take these propositions to be made true respectively by the substantial facts that murder is, as a matter of objective fact, wrong, and that all neutrinos are uncharged. But as Alan Musgrave (1993: 266), Heather Dyke (2007: 5) and others have observed, the existence of these entities can't be entailed by the corresponding instances of the equivalence principle, namely:

⟨Neutrinos have no charge⟩ is true if and only if neutrinos have no charge; and
⟨Murder is wrong⟩ is true if and only if murder is wrong.

For an equivalence principle that *did* have these entailments would immediately contradict (a) *anti-realists* who say that these apparent propositions have *no* truth values and so need *no* truthmakers (Ayer 1946), (b) *ethical naturalists* who think that ⟨Murder is wrong⟩ is made true by natural facts (Foot 1978), (c) *empiricists* who think that ⟨Neutrinos have no charge⟩ is made true by observable facts (Ramsey 1929) and (d) – to take another example – *physicalists* who take *psychological* truths to be made true by *physical* facts (Armstrong 1993).

But no one thinks the equivalence principle can do all *that*: no one expects a theory of *truth* to settle the ontologies of value, scientific theories or the mind. *They* can only be settled by *truthmaker* theories: not theories of what truthmakers *are*, but of what truthmakers *exist* – theories that may or may not postulate values, theoretical entities or non-physical mental states. *Those* are the theories about which, in any given field, realists about that field, and their opponents, disagree. And, for *moderate* truthmaker theorists, they are also, as we shall see, the theories that tell us *which* propositions are *primary*, i.e. which propositions need *non*-propositional truthmakers to make them true.

4. Realism

First, however, I must digress to tackle a widely held objection to all truthmaker theories, whether moderate or maximal (Hornsby 2005). Consider the propositions that we use to state the truthmakers of *other* true propositions: for example. the propositions of *physics* that physicalists say tell us what the truthmakers of *psychological* truths are (Armstrong 1993). If we now ask what makes these truthmaker-stating propositions true, it looks as if any non-

[4] (EP) is not completely uncontentious. It fails for non-classical logics in which, for example, 'if "P" is indeterminate (as it is if it is a future contingent), "It is true that P" is false (rather than being itself indeterminate)' (Bourne 2006: 94). Here, however, I shall take (EP) for granted, and leave others to say how truthmaking would fare if it failed.

trivial answer must itself be a proposition that invites the same question – what makes *it* true? – thereby setting off an endless and arguably vicious regress..

This objection to truthmaker theories has a hidden assumption, made explicit in Hilary Putnam's attacks on what he calls 'metaphysical realism', the thesis that even our best scientific theories might be false because the world isn't as they say it is. The assumption is that, as he puts it, '*we* interpret our languages or nothing does' (Putnam 1980: 482), meaning that nothing in the world outside us constrains what our best theories are about. And the *argument* for this is that any *statement* of an external constraint on what a theory is about, and in particular of what would make that theory *true*, merely *extends* the theory, whose extended form we can then always interpret so as to make it come out true.

The right response to this argument is to reject the assumption that nothing other than ourselves can constrain what our scientific theories are about, and hence what makes them true or false. In short, as David Lewis puts it,

> realism needs realism: the realism that recognises a non-trivial enterprise of discovering the truth about the world needs the traditional realism that recognises objective sameness and difference, joints in the world, discriminatory classifications not of our own making (Lewis 1984: 228).

This is the realism that all truthmaker theorists must take for granted, since without it the whole idea of non-propositional truthmakers makes no sense, and nor then does the question of which truths have them and which don't.

This realism doesn't, by the way, commit us to realism about *universals*. The natural properties – temperatures, masses, etc. – that embody 'objective sameness and difference' *could* be exactly resembling particulars (Rodriguez-Pereyra 2002) or tropes (Williams 1953). For truthmaking purposes, *any* theory of properties will do that doesn't reduce them to shadows of predicates privileged on merely linguistic grounds – as, for example, Nelson Goodman's (1965: ch. IV) 'projectibility' criterion of inductive respectability does. But that criterion's back to front anyway. It's not our use of the predicate 'blue' to make inductive predictions that makes blue a natural property: it's the other way round. What makes 'blue' a better predicate to use in inductive predictions than Goodman's 'grue' is the fact that 'blue', unlike 'grue', corresponds to a natural property, or at least to a disjunction of conjunctions of them (Mellor 1997).

5. Truthmakers and truth conditions

This distinction, between properties and predicates, implies that, as Heather Dyke (2007: ch. 2) and others observe, a theory of truthmakers is no more a theory of *meaning* than it is of truth. In particular, the truth*makers* of propositions mustn't be identified with their meta-linguistic truth *conditions*. The temptation to conflate the two derives from an ambiguity in

claiming to 'give a sentence's truth conditions'. The ambiguity is between saying what would *make* the sentence true, and using a Tarskian meta-language to say when it *is* true. And the quickest way to see how these differ is to recall that it's only to protect so-called object languages from the Liar and other paradoxes that Tarski deports their semantic predicates, like 'true' and 'false', into meta-languages, which we can then safely use to say when object-language sentences are true (Tarski 1944: §9). For a meta-language can do *that* even if its *non*-semantic predicates are *identical* with those of its object language. And if they *are* identical, then a meta-linguistic statement of a sentence's truth conditions, like

'Fred has toothache' is true if and only if Fred has toothache,

will tell us no more than the equivalence principle does about what *makes* 'Fred has toothache' true. A meta-language can only tell us *that* if its non-semantic predicates *differ* from those of its object language, and do so in a way that gives ontological authority to its statements of truth conditions. But then it takes a *non*-linguistic argument, like that from the so-called 'causal closure' of physics (Papineau 2007: §1.6), to justify granting this authority to a sentence like

'Fred has toothache' is true if and only if Fred is in a brain state (of type) C,

which physicalists think *does* tell us what makes 'Fred has toothache' true.

Some philosophers, however, deny that a meta-language *can* have this ontological authority. Rudolf Carnap, for example, distinguishes two kinds of ontological questions: those *internal* to a given language, or 'linguistic framework', and those *external* to it. *Internal* questions, raised within (say) a 'thing language', such as – I quote –

> 'Is there a white piece of paper on my desk?', 'Did King Arthur actually live?', 'Are unicorns real or merely imaginary?', and the like … are to be answered by empirical investigations. …
>
> From these questions we must [says Carnap] distinguish the external question of the reality of the thing world itself … [This question] cannot be solved because it is framed in the wrong way. To be real in the scientific sense means to be an element of the system; hence this concept cannot be meaningfully applied to the system itself (Carnap 1950: 242–3).

In other words, while we can use a meta-language of things to answer internal questions about whether King Arthur or unicorns exist, we can't question the ontology of the meta-language itself. To do *that*, using a 'meta-meta-language', only starts a hopeless regress: for we must stop *somewhere* if we're to give truth conditions at all; and wherever we stop, we can't then question the ontology of whatever meta-language we stop at. That's why, for

Carnap, the justification for using our 'thing language' lies in its *utility*, not in the existence of the entities it postulates.

This seems to me both *false* and a false *dichotomy*. The *dichotomy's* false because the utility of our 'thing language' depends on there *being* entities of most of the kinds it recognises. It's the existence, effects and microstructure of water that *makes* the predicates 'is water' and 'is H_2O' more useful parts of our 'linguistic framework' than any 'gruified' alternatives would be. And the *doctrine's* false because 'to be real in the scientific sense' *doesn't*, as Carnap claims, mean 'to be an element of the system', and Carnap no more shows that this is all it *can* mean than Putnam does. On the contrary: it's the discovery of new kinds of physical entities that makes it not just useful but *essential* for physicists to add them to their theoretical systems, not the utility of their additions that entitles us to call entities of those kinds real.

6. The merits of moderation

So far, I hope and believe, I and David Armstrong agree. Where we part company is, as I've said, that he thinks *all* truths have truthmakers, and I think some don't: why? I argued at the start that truth's supervenience on being doesn't *require* all truths to have truthmakers; but nor, on the other hand, does it require any truths to *lack* them. Why then do I think that some truths do lack truthmakers? Here are five reasons.

(1) *Ontological economy*. I've remarked that truth's supervenience on being means that there *must* be more to truthmaking than the entailment of a true proposition ⟨P⟩ by a proposition of the form ⟨S exists⟩. Yet as being entailed by another truth *does* ensure ⟨P⟩'s truth, and as many truths *are* entailed by others that *aren't* of the form ⟨S exists⟩, it's not obvious that these truths need *non*-propositional truthmakers. And if they don't, then Ockham's razor tells us not to postulate truthmakers beyond necessity.

(2) *Negative truths*. Suppose ⟨P⟩ is a primary proposition, i.e. one which has, if true, a truthmaker, S. If ⟨P⟩ is *false*, then in classical logic its negation ⟨¬P⟩ will be true and therefore, if *all* truths have truthmakers, will have a *different* truthmaker, S′. Then the classical laws of non-contradiction and excluded middle, which tell us that ⟨P⟩ and ⟨¬P⟩ can't *both* be true but that one of them *must* be, require S′ to exist if and only if S *doesn't* exist. Yet why, if S and S′ are distinct entities, must this be so? To assert it, with no independent reason to do so, is merely to restate in the language of ontology two laws of logic whose validity a theory of truthmakers should surely aim to explain.

And so it can, provided it takes ⟨¬P⟩'s truth to follow, *not* from the existence of its own truthmaker S′, but from the *non*-existence of ⟨P⟩'s truthmaker S. For then, the fact that ⟨¬P⟩ is true if and only if ⟨P⟩ is false follows from applying classical logic, not to *all* pairs of contradictory propositions, but only to some of those where one member has the form ⟨S exists⟩. This lets us take the laws of non-contradiction and excluded middle to follow, where

they do, from two *ontological* facts: (a) *the truthmaking relation between any entity S and any primary proposition ⟨P⟩ can, like all relations, only relate entities that exist; and* (b) *all entities must either exist or not and can't do both*. (a) explains why a truthmaking relation can only make a primary proposition ⟨P⟩ true if its truthmaker S exists; and, if we assume that ⟨¬P⟩ is true if and only if S *doesn't* exist, (b) explains why ⟨P⟩ and ⟨¬P⟩ satisfy the laws of non-contradiction and excluded middle. (As will all complete truth functions of primary propositions, and hence all non-primary propositions.[5])

(3) *Disjunctive truths*. If crediting true *negations* of primary propositions with needless truthmakers limits truthmaker theory's *explanatory* power, crediting true *disjunctions* with truthmakers has *direr* consequences. Take a true disjunction ⟨P∨Q⟩ of two primary propositions ⟨P⟩ and ⟨Q⟩ that are made true, *if* they are, by truthmakers S and T respectively. What makes their disjunction true? Presumably, if ⟨P⟩ is true and ⟨Q⟩ isn't, S does; and if ⟨Q⟩ is true and ⟨P⟩ isn't, T does. In short, the truthmaker, if any, of a disjunction with only one true disjunct will also be what makes that disjunct true.

Now suppose that ⟨P⟩ is true, that ⟨Q⟩ is ⟨¬P⟩, and therefore that the disjunction ⟨P∨¬P⟩ is made true by ⟨P⟩'s truthmaker S. But *this* disjunction, ⟨P∨¬P⟩, is a *necessary* truth and therefore, in classical logic, entailed by *every* proposition, including every truth that asserts the existence of *any* truthmaker. So if truthmakers make true every proposition that their existence entails, then *all* of them are truthmakers for *every* necessary truth, including ⟨P∨¬P⟩. And then, if the truthmaker of a disjunction with only one true disjunct also makes that *disjunct* true, it follows that *all* truths have the *same* truthmakers, namely *all* truthmakers.

This result, which Greg Restall (1996: 334) calls 'truthmaker monism' is, as he says, 'not acceptable for any philosophically discriminating account of truthmakers'. He himself blocks it with a restricted concept of 'real entailment' that lets a proposition ⟨P⟩ *really* entail a proposition ⟨R⟩ only if, in every possible world, every truthmaker for ⟨P⟩ is a truthmaker for ⟨R⟩. But this begs the question in favour of *maximalism*: for unless true negations *have* truthmakers, it will stop them 'really entailing' anything, which is absurd.

We can banish this absurdity, along with truthmaker monism, by simply denying that disjunctive truths *have* any non-propositional truthmakers, and hence that the necessary disjunction ⟨P∨¬P⟩ has one. Moderate truthmaker theorists need no *ad hoc* restrictions on classical entailment to make their theory 'philosophically discriminating'.

(4) *Conjunctive truths*. What makes the conjunction, ⟨P∧Q⟩, of two primary propositions ⟨P⟩ and ⟨Q⟩ true? Since this conjunction will be true if and only if both its *conjuncts* are, its truthmaker, if any, will need to exist if and only if both their truthmakers, S and T, exist. The

[5] Taking non-primary propositions to be *complete* truth functions of primary ones may seem to presuppose the law of excluded middle by requiring all such propositions to be either true or false. And so it would if we excluded 'neither true nor false' as a possible value of a complete truth function. But we need not do this. For if, as I argue here, all *primary* propositions are either true or false, no credible truth function of any number of them will ever be neither true nor false.

only entity which fits *that* bill is the *mereological sum*, S+T, that S and T, by mere definition, compose. So ⟨P∧Q⟩ will only have a truthmaker if this sum exists; and *all* conjunctions of primary truths will only have truthmakers if the truthmakers of any number of primary truths *always* have a mereological sum.

But this principle, of *unrestricted mereological composition* (Lewis 1986: 211–13), is highly contentious, and I and many others have argued against it (Mellor 2006). I see *no* independent reason to suppose that every two entities, however disparate – like me and World War II – compose a third. And without *some* such reason, it's gratuitous to postulate sums just to provide true conjunctions with non-propositional truthmakers which, since they're already entailed by their conjuncts, they don't need.

(5) *Necessary truths*. My objection to letting *disjunctive* truths have truthmakers, while it applies to *some* necessary truths, like ⟨P∨¬P⟩, doesn't apply to *all* necessary truths. In particular, it doesn't apply to truths of *identity* like ⟨S=S⟩, of which the entity S may seem as natural a truthmaker as it is of the proposition that S exists. Nevertheless, I propose to deny truthmakers to these truths too, for a reason I've already given: namely, that ⟨S=S⟩, like all necessary truths, is entailed by *every* existential truth, a fact that makes it as hard to say what makes S *the* truthmaker of ⟨S=S⟩ as it is to say what makes S *the* truthmaker of ⟨S exists ∨ S doesn't exist⟩.[6]

The only necessary truths that I think *may* have truthmakers are positive *existential* ones like 'There are prime numbers'. For only by letting *some* such truths have truthmakers can we avoid concluding that only *contingent* entities exist. But while I think that may indeed be true, it's not a point I need to argue here. For since *every* necessary proposition is true in *all* possible worlds, and is therefore a complete truth function of every *primary* proposition, its truth will supervene on being in any case, if only trivially so: since a proposition whose truth value is the same in *all* worlds must, in particular, have the same truth value in worlds that don't differ in being.

7. Primary propositions: atomic

But whatever truthmaker theorists say about necessary truths, their *main* job is to account for the *contingent* ones to which I'll therefore confine myself from now on. And then the remaining question for us moderate truthmaker theorists is this: if only *some* contingent truths have truthmakers, what determines which these are?

The answer to this question seems to me implicit in the realism that 'recognises objective sameness and difference' and hence the natural properties – masses, temperatures, charges,

[6] S might still have a unique ontological relation to ⟨S=S⟩ if that proposition, while true in all possible worlds where it exists, only exists in S-worlds. S could then be the truthmaker, if not of ⟨S=S⟩ itself, then at least of the related but contingent proposition ⟨⟨S=S⟩ exists⟩. But as whether this is possible depends on what propositions are – they could not, for example, be sets of possible worlds – I shall not pursue the idea.

durations, etc. – that embody this sameness and difference in and between things and events. But then a contingent proposition ⟨P⟩ that credits a thing or event *a* with one of these properties *F* [7] will be a primary proposition, i.e. one which, if true, is made so by *a*'s being *F*; and similarly for contingent relations, like the spacetime separations of special relativity.

What truthmakers like *a*'s being *F are* – tropes, combinations of particulars and universals, or something else again – depends on what contingent particulars, properties, relations, times, etc., are. But that's not our business, which is only to say what *determines which* entities there are, not of what *kinds* those entities are. That's why, as I said earlier, we needn't take properties to be *universals*: belief in truthmakers is compatible with *any* view of properties that doesn't 'reduce them to shadows of predicates privileged on merely linguistic grounds'. Similarly, we can take any view of *particulars* that's consistent with our view of properties and doesn't reduce particulars to shadows of linguistically privileged items, in this case singular terms. Within these limits, truthmaker theorists can take particulars to be 'bare' particulars, haecceities, bundles of properties, tropes, or aggregates (Bigelow 1998).

It's true of course that *what* particulars there are depends on what *kinds* of entities there are. There will, for example, be more particulars if *events* are particulars (Davidson 1970) than if they aren't; as there will if spacetime points or regions are particulars (Nerlich 1994), or if all temporally extended entities have temporal as well as spatial parts (Hawley 2004). Conversely, if reality's limited to what's *present* (or to what's *past* or present), there'll be *fewer* particulars than if past, present and future entities are all equally real (Dyke 2005).

These are all contentious questions; but they too aren't questions I need to answer here. *Here* I need only say how their answers affect which propositions are primary, which I think they do by affecting the output of what I call *Quine's test*, derived from his (1948) criterion of 'ontological commitment'. The test is this: *the particulars that exist are those over which our first-order quantifiers must range for any truth to be statable without using names or other singular terms* (Mellor 1995: ch. 15.7). That's what I think determines which particulars, and of which kinds, are truthmakers – or constituents of truthmakers – and therefore part of what determines which propositions are primary.

Similarly for natural properties if, as I, Sydney Shoemaker and others hold (Shoemaker 1980; Mellor 1995: ch. 15), there's no more to them than the causation or the laws of nature they occur in: no more to masses than the laws of motion, gravity, etc. that contain them; no more to temperatures than the laws of thermodynamics, statistical mechanics, etc.; no more to beliefs, desires and other intentional mental states than the laws, if any, of intentional psychology; and so on. On this view of properties and laws, what properties there are can be determined by what I call *Ramsey's test*, analogous to Quine's test for particulars. The test is this: *the properties that exist are those over which our higher-order existential quantifiers must range for any law of nature to be statable without using predicates*. In other words, the

[7] Or, if *F* is changeable, with being *F* at a time *t*, a qualification I shall hereafter take as read.

properties that exist are those over which the existential quantifiers of a Ramsey sentence ∑ of the conjunction of all true law statements would have to range for ∑ to be true (Mellor 1995: ch. 15.4–6).[8]

8. Primary propositions: molecular

All the primary propositions that I've so far proposed ascribe properties (including relations) *Fx*, *Rxy*, etc. that pass *Ramsey's* test to particulars *a*, *b*, etc. that pass *Quine's* test. That makes these propositions – ⟨*Fa*⟩, ⟨*Rab*⟩, etc. – *atomic* since, unlike the molecular propositions ⟨¬*Fa*⟩, ⟨*Fa*∧*Fb*⟩, ⟨*Fa*∨*Rab*⟩, etc., they don't contain any *other* propositions.

But not *all* primary propositions are atomic: many propositions contain others of which they *aren't* complete truth functions. Take ascriptions of mental states like ⟨X believes that P⟩, or propositions like ⟨Probably P⟩, or counterfactuals like ⟨If ⟨P⟩ were false, ⟨Q⟩ would be⟩. Few if any of these molecular propositions are *complete* truth functions of their constituent propositions if those constituents are *contingent*: for generally, whether a contingent ⟨P⟩ is true or false, we may or may not *believe* it, its truth may or may not be *probable* and, if ⟨P⟩ and ⟨Q⟩ are true, ⟨Q⟩ might or might not have been true had ⟨P⟩ been *false*. So on the present view, since the truth values of these and many other molecular propositions are *not* always fixed by those of their constituents, they too are primary: they too need truthmakers to make them true.

Saying what their truthmakers are is, of course, a task for theories of the mind, of probability, of conditionals, and so on. Debates about physicalism, for example, are debates about whether psychological truths, such as true instances of ⟨X believes that P⟩, only ever have physical truthmakers. Similarly with metaphysical debates about probability. Suppose the sentence 'Probably P' credits ⟨P⟩ with a greater *chance* of being true than ⟨¬P⟩, as in ⟨The coin's chance of landing heads >1/2⟩, and suppose that's true. What *makes* it true depends on whether, for example, *chances* are *frequencies*, actual or hypothetical, *propensities* or quantitative *possibilities* (Mellor 2005: chs 3–4). And similarly for theories of subjective and epistemic probabilities.[9]

Similarly too for non-truth-functional counterfactuals. For David Lewis (1973), what makes it true, if it is, that if ⟨P⟩ were false, ⟨Q⟩ would be, is that ⟨¬Q⟩ is true in all the possible worlds most like ours where ⟨¬P⟩ is true. For those of us who think thjat only *our* world exists, this counterfactual needs an *actual* truthmaker to make it true: for example, an object *a*'s having a mass *M*, which is the actual truthmaker for all true instances of ⟨if a force

[8] ∑, unlike Ramsey's own sentences (1929), results from substituting existentially bound variables for *all* predicates, not just theoretical ones, in the conjunction of all true law statements.

[9] This assumes that objective epistemic probabilities exist and are contingent. On the present view, true ascriptions of them will need no truthmakers if they are necessary, as many of their advocates believe (Mellor 2005: ch. 6).

F were applied to *a* that didn't alter *M*, *a* would accelerate at *F*/*M* in the direction of *F*⟩ (Mellor 2000: §5).

9. Laws of nature

Finally, there *may* be primary propositions that are neither atomic nor molecular: statements of *laws of nature*, for example. However, what makes *them* true will depend, for a start, on whether laws are necessary or contingent. If they're *necessary*, i.e. hold in all possible worlds, then I take statements of them, like all necessary truths, to need, and therefore to have, *no* truthmakers. But while that reading of law statements obviates an otherwise tricky question of what makes them true, it is also highly contentious. So we also need to ask what will make law statements true if they're *not* necessary?

One tempting answer to *that* question follows from Stephen Mumford's (2004: ch. 10) view of properties as *embodying* the laws they occur in. This lets laws be contingent, though only on properties, since law statements will then not only entail but be entailed by the existence of the properties they contain. And that, unfortunately, stops properties being as free to occur in different laws as particulars are to have different properties: it stops ice, for example, melting at slightly more or less than 32°F in other possible worlds.

That's why I prefer the answer that follows from Frank Ramsey's (1928) and David Lewis's (1973: ch. 3.3) theory, that what makes general truths like ⟨All *F*s are *G*s⟩ state *laws* is their being, as Ramsey put it, among the

> consequences of those propositions which we should take as axioms if we knew everything and organized it as simply as possible in a deductive system (Ramsey 1929: 150).

For as this only tells us which truths *actually* state laws, it doesn't prevent somewhat *different* laws – e.g. giving ice a different melting point – containing the very same properties.

Better still, the Ramsey-Lewis theory may even let contingent law statements lack truthmakers altogether. For on this theory, all it takes to make ⟨All *F*s are *G*s⟩ true, whether it states a law or not, is that all *actual F*s are *G*s, i.e. that every actual particular, *a*, *b*, … is either *G* or ¬*F*. And *this* generalisation is arguably equivalent to the possibly infinite conjunction

$$(Ga \vee \neg Fa) \wedge (Gb \vee \neg Fb) \wedge \ldots$$

and thus a complete truth function of the primary propositions ⟨*F*a⟩, ⟨*G*a⟩, ⟨*Fb*⟩, ⟨*Gb*⟩, … (Ramsey 1927: 48–9). And if ⟨All *F*s are *G*s⟩ *is* such a truth function, then on a moderate view of truthmaking it will need no truthmaker to make it true. Unfortunately, to this congenial conclusion, that general truths need no truthmakers, there's an obvious and serious objection that I must now, in conclusion, try to meet.

10. General truths

Suppose for simplicity that ⟨All *F*s are *G*s⟩ isn't a law statement, but is a merely accidental truth, like ⟨All members of the band have perfect pitch⟩, where neither the predicate '*F*' ('is a band member') nor the predicate '*G*' ('has perfect pitch') need correspond to a natural property. Now suppose the band has just two members, *a* and *b*, both of whom are *G*, where the propositions ⟨*Ga*⟩ and ⟨*Gb*⟩ are made true either directly, if the predicate '*G*' *does* correspond to a property, or indirectly, if ⟨*Ga*⟩ and ⟨*Gb*⟩ are non-primary propositions entailed by other truths. What makes ⟨All *F*s are *G*s⟩ true?

The obvious objection to the claim that this general truth *needs* no truthmaker, because it's a complete truth function of its instances, is that its instances, ⟨*Ga*⟩ and ⟨*Gb*⟩, don't *entail* it, since they don't entail that *a* and *b* are all the *F*s there are. To get a proposition that *does* entail it, we must conjoin to ⟨*Ga*⟩ and ⟨*Gb*⟩ the true proposition that there are no *F*s except *a* and *b*. But as this truth is contingent – the band *could* have had more members – and is entailed by no *other* truths, it seems to need its own truthmaker. Yet how can a *negative* existential truth like ⟨There are no *F*s except *a* and *b*⟩ *have* a truthmaker: what entity could there be whose existence entails that other entities *don't* exist?

Several answers have been offered to that question. David Armstrong (1997: ch. 13), for example, follows Russell (1918: ch. 5) in postulating 'totality facts' as truthmakers for general truths; while David Lewis and Gideon Rosen (2003) take what they call 'the world *qua*-just-as-it-is' (i.e. the mereological sum of everything) to make it true that, for example, there are no unicorns. To all these various answers there are equally various objections, which any theory that credits all contingent truths with truthmakers needs to meet.

In moderate truthmaker theories, on the other hand, negative existential truths *need* no truthmakers, because *no* negative truths need them (Heil 2000: §2). On these theories, all it takes to make true the proposition that there are no *F*s except *a* and *b* is that ⟨*Fa*⟩ and ⟨*Fb*⟩ are indeed the only true instances of the propositional function ⟨*F*…⟩. And then whatever makes the propositions ⟨*Ga*⟩ and ⟨*Gb*⟩ true, directly or indirectly, will *also* make it true that *all F*s are *G*s, even if ⟨*Ga*⟩ and ⟨*Gb*⟩ don't entail that general truth.

If this exception to the general rule that non-primary truths are *entailed* by other truths seems surprising, it really shouldn't, since it's an immediate consequence of denying that negative truths have truthmakers. And once we deny *that*, for the reasons I've given, the simple answer this denial offers to the question of what makes general truths true (and hence, on the Ramsey–Lewis view of laws, of what makes *law* statements true) – namely, *nothing but the truth of their instances* – provides yet another reason for preferring moderate truthmaker theories to maximalist ones.

References

Armstrong, D. M. (1993) *A Materialist Theory of the Mind* (revised edn). New York, Routledge.

-- (1997) *A World of States of Affairs*. Cambridge, Cambridge University Press.

-- (2003) 'Truthmakers for Modal Truths' in *Real Metaphysics: Essays in Honour of D. H. Mellor*, ed. H. Lillehammer and G. Rodriguez Pereyra. New York, Routledge**:** 12–24.

Ayer, A. J. (1946) *Language, Truth and Logic* (Revised edn). Oxford, Oxford University Press.

Bigelow, J. (1988) *The Reality of Numbers: a Physicalist's Philosophy of Mathematics*. Oxford, Clarendon Press.

-- (1998) 'Particulars' in *Routledge Encyclopedia of Philosophy*, ed. E. J. Craig. London, Routledge.

Bourne, C. (2006) *A Future for Presentism*. Oxford, Clarendon Press.

Candlish, S. (2005) 'Truth, Identity Theory of' in *Routledge Encyclopedia of Philosophy*, ed. E. J. Craig. London, Routledge.

Carnap, R. (1950) 'Empiricism, Semantics and Ontology' in *Philosophy of Mathematics* (2nd edn), ed. P. Benacerraf and H. Putnam. Cambridge, Cambridge University Press (1983)**:** 241–257.

Davidson, D. (1970) 'Events as Particulars' in his *Essays on Actions and Events*. Oxford, Clarendon Press: 181–187.

Dyke, H. (2005) 'Time, metaphysics of' in *Routledge Encyclopedia of Philosophy*, ed. E. J. Craig. London, Routledge.

-- (2007) *Metaphysics and the Representational Fallacy*. London, Routledge.

Foot, P. (1978) *Virtues and Vices*. Berkeley, University of California Press.

Forrest, P. and Khlentzos, D. (2000) 'Introduction: Truth Maker and its Variants' *Logique et Analyse* 43(169–70): 3–15.

Goodman, N. (1965) *Fact, Fiction, and Forecast* (2nd edn). New York, Bobbs-Merrill.

Hawley, K. (2004) 'Temporal Parts' in *Stanford Encyclopedia of Philosophy* (Winter 2004 edn), ed. E. N. Zalta. URL = <http://plato.stanford.edu/archives/win2004/entries/temporal-parts/>.

Heil, J. (2000) 'Truth Making and Entailment' *Logique et Analyse* 43(169–70): 231–242.

Hornsby, J. (2005) 'Truth without Truthmaking Entities' in *Truthmakers: The Contemporary Debate*, ed. H. Beebee and J. Dodd. Oxford, Clarendon Press**:** 33–47.

Lewis, D. K. (1973) *Counterfactuals*. Oxford, Blackwell.

-- (1984) 'Putnam's Paradox' *Australasian Journal of Philosophy* 62: 221–236.

-- (1986) *On the Plurality of Worlds*. Oxford, Blackwell.

-- (2003) 'Things qua Truthmakers' in *Real Metaphysics*, ed. H. Lillehammer and G. Rodriguez-Pereyra. London, Routledge (2002)**:** 25–42.

Martin, C. B. (1996) 'How It Is: Entities, Absences and Voids' *Australasian Journal of Philosophy* 74: 57–65.

Mellor, D. H. (1995) *The Facts of Causation*. London, Routledge.

-- (1997) 'Properties and Predicates' in *Properties*, ed. D. H. Mellor and A. Oliver. Oxford, Oxford University Press**:** 255–267.

-- (2000) 'The Semantics and Ontology of Dispositions' *Mind* 109: 757–780.

-- (2004) 'Wahrmacher' in *Wahrheit in Perspektiven: Probleme einer offenen Konstellation*, ed. I. U. Dalferth and P. Stoellger. Tübingen, Mohr Siebeck**:** 103–118.

-- (2005) *Probability: A Philosophical Introduction*. London, Routledge.

-- (2006) 'Wholes and Parts: the Limits of Composition' *South African Journal of Philosophy* 25: 138–145.

Mumford, S. (2004) *Laws in Nature*. London, Routledge.

Musgrave, A. (1993) *Common Sense, Science and Scepticism*. Cambridge, Cambridge University Press.

Nerlich, G. (1994) *The Shape of Space* (2nd edn). Cambridge, Cambridge University Press.

Papineau, D. (2007) 'Naturalism' in *The Stanford Encyclopedia of Philosophy* (Spring 2007 edn), ed. E. N. Zalta. URL = <http://plato.stanford.edu/archives/spr2007/entries/naturalism/>.

Putnam, H. (1980) 'Models and Reality' *Journal of Symbolic Logic* 45: 464–482.

Quine, W. v. O. (1948) 'On What There Is' in his *From a Logical Point of View*. Cambridge, Mass., Harvard University Press: 1–19.

Ramsey, F. P. (1927) 'Facts and Propositions' in his *Philosophical Papers*, ed. D. H. Mellor. Cambridge, Cambridge University Press: 34–51.

-- (1928) 'Universals of Law and of Fact' in his *Philosophical Papers*, ed. D. H. Mellor. Cambridge, Cambridge University Press: 140–144.

-- (1929) 'General Propositions and Causality' in his *Philosophical Papers*, ed. D. H. Mellor. Cambridge, Cambridge University Press: 145–163.

-- (1929) 'Theories' in his *Philosophical Papers*, ed. D. H. Mellor. Cambridge, Cambridge University Press: 112–136.

Restall, G. (1996) 'Truthmakers, Entailment and Necessity' *Australasian Journal of Philosophy* 74: 331–340.

Rodriguez-Pereyra, G. (2002) *Resemblance Nominalism*. Oxford, Clarendon Press.

-- (2005) 'Why Truthmakers' in *Truthmakers: The Contemporary Debate*, ed. H. Beebee and J. Dodd. Oxford, Clarendon Press**:** 17–31.

Rosen, G. and Lewis, D. (2003) 'Postscript to "Things qua Truthmakers": Negative Existentials' in *Real Metaphysics: Essays in Honour of D. H. Mellor*, ed. H. Lillehammer and G. Rodriguez-Pereyra. London, Routledge**:** 39–42.

Russell, B. (1918) *The Philosophy of Logical Atomism*, ed. D. Pears. La Salle, Illinois, Open Court.

Shoemaker, S. (1980) 'Causality and Properties' in *Properties*, ed. D. H. Mellor and A. Oliver. Oxford, Oxford University Press (1997)**:** 228–254.

Tarski, A. (1944) 'The Semantic Conception of Truth' in *Readings in Philosophical Analysis*, ed. H. Feigl and W. Sellars. New York, Appleton-Century-Crofts (1949)**:** 52–84.

Williams, D. C. (1953) 'On the Elements of Being: I' in *Properties*, ed. D. H. Mellor and A. Oliver. Oxford, Oxford University Press**:** 112–124.