



Truthmakers

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Abstract

This bulletin contains a summary of the main topics of discussion in truthmaker theory, namely: the definition of truthmakers, problems with Truthmaker Necessitarianism and Truthmaker Maximalism, the ontological burden of truthmakers and the recalcitrant topic of truthmakers for negative truths.

1. Introduction

Truthmaking has become one of the most important metaphysical topics of the late 20th-century and early 21st-century philosophy. To believe in truthmaking is, basically, to believe that truth is grounded in the world or reality. Some, but not all, of those who believe in truthmaking believe in truthmakers, i.e. they believe that truth is grounded in *entities*. Those who believe in truthmaking but not in truthmakers believe that truth is grounded not in entities but in how entities are. That is, a true proposition like <The rose is red> is true in virtue of how the rose is.¹ But others think that that proposition is true in virtue of a certain entity, e.g. the state of affairs of the rose's being red, or the redness of the rose. That truth is grounded is relatively uncontroversial. That truth is grounded in entities is, on the contrary, very controversial.

2. What is a Truthmaker?

Some propose a definition of truthmakers in terms of a certain notion of entailment:

(1) Entity *e* is a truthmaker for <P> if and only if *e* exists and <*e* exists> entails <P>.²

In this definition 'entails' should be understood as 'strictly implies', so that <*e* exists> entails <P> if and only if it is impossible that <*e* exists> is true and <P> is false. With this understanding of entailment, definition (1) faces several problems. First, it makes every existent entity a truthmaker for every necessary truth. For every entity entails every necessary truth. But it does not seem plausible that Madonna is a truthmaker for the proposition that *squares have four sides*. Second, this definition may have the consequence

that every existent entity is a truthmaker for every truth, whether necessary or contingent. For suppose we accept the following principles:

(2) If entity e makes $\langle P \vee Q \rangle$ true then either e makes $\langle P \rangle$ true or e makes $\langle Q \rangle$ true.

(3) For every proposition $\langle P \rangle$, if $\langle P \rangle$ is not true then nothing makes it true.

The proposition $\langle P \vee \neg P \rangle$, being necessarily true, is entailed by every proposition. So every existent entity makes it true. But if $\langle P \vee \neg P \rangle$ is true, then either $\langle P \rangle$ is true or $\langle \neg P \rangle$ is true. Suppose that $\langle P \rangle$ is true. Then, according to (3), nothing makes $\langle \neg P \rangle$ true. So whatever makes $\langle P \vee \neg P \rangle$ true must, according to (2), make $\langle P \rangle$ true. But every existent entity makes $\langle P \vee \neg P \rangle$ true. So every existent entity makes $\langle P \rangle$ true.

Some (e.g. Read 2000) opt for rejecting (2), the so-called *Disjunction Thesis*. But this principle is intuitively plausible and, furthermore, the other problem with (1), namely that it makes every existent entity a truthmaker for every necessary truth, is independent from (2).

There is consensus in the literature that (1) is defective, but there is no consensus as to what should replace it. Some suggest that the solution should consist in defining truthmakers in terms of *relevant* entailment:

(4) Entity e is a truthmaker for $\langle P \rangle$ if and only if $\langle P \rangle$ is true and $\langle e \text{ exists} \rangle$ relevantly entails $\langle P \rangle$.³

The problem here is that there is a variety of different systems of relevant logic, each one validating different entailments. To make (4) precise one needs to specify what system of relevant logic the notion of entailment in (4) belongs to. And there is no guarantee that any system of relevant logic will have a notion of entailment such that whenever $\langle e \text{ exists} \rangle$ entails, in the sense of the system in question, a true proposition $\langle P \rangle$, e is a truthmaker for $\langle P \rangle$.

An alternative is to take the notion of *true in virtue of* as a primitive and take the following as the true definition of truthmakers (Rodríguez-Pereyra 2002, p. 34):

(5) Entity e makes $\langle P \rangle$ true if and only if $\langle P \rangle$ is true in virtue of e .⁴

Others prefer to define truthmakers in terms of the notion of essence (Lowe 2006, p. 203):

(6) Entity e is a truthmaker for $\langle P \rangle$ if and only if it is part of the essence of $\langle P \rangle$ that $\langle P \rangle$ is true if e exists.⁵

Those who think that the notion of *in virtue of* is irremediably obscure would stay away from (5) and would, if they think the notion of *essence* to be any clearer, prefer (6) to it. But it may be argued that the notion of essence must be explained in terms of the notion of *in virtue of*. On the other

hand many find both notions, even if neither is to be defined in terms of the other, irremediably obscure. Thus the proper definition or conception of truthmakers is one of the central areas of research for truthmaker theorists.

But that consensus has not been reached in this area does not mean that there is no agreement at all as to what truthmakers are. Most truthmaker theorists agree that truthmakers necessitate the propositions they make true (Parsons 1999 is one exception). Thus truthmaker theorists endorse what Armstrong has called *Truthmaker Necessitarianism* (2004, p. 5), which can be formulated as follows:

(7) If e is a truthmaker for $\langle P \rangle$ then, necessarily, if e exists then $\langle P \rangle$ is true.

(7) does not have the problems (1) has, but it is not free of problems. For instance, in combination with (8), known as the *converse Barcan formula*, (7) leads to the result that no contingent truths have truthmakers.

(8) $\Box \forall x: \phi \supset \forall x: \Box \phi$

For consider (9), an instance of (8), which says that if it is necessary that everything exists, then everything exists necessarily:

(9) $\Box \forall x: x \text{ exists} \supset \forall x: \Box (x \text{ exists})$

But it is necessary that everything exists. Therefore, everything exists necessarily. Now, if everything exists necessarily, every truthmaker exists necessarily. And if every truthmaker exists necessarily, (7) entails that every truth with a truthmaker is a necessary truth. So no contingent truth has a truthmaker! This is contrary to what most truthmaker theorists have thought, since they are usually prepared to let necessary truths lack truthmakers, but not contingent truths.

The obvious way out is to reject (8). But rejecting (8) is not as easy as it might seem (see Williamson 1999, p. 264. Since Williamson deployed the argument in the context of Truthmaker Maximalism – see section 4 – his conclusion was that (7) and (8) lead to modal collapse i.e. that all truths are necessary). Thus an important task for truthmaker theorists is to develop a theory that makes Truthmaker Necessitarianism avoid this problem.

3. What is Truthmaking?

For those who believe in truthmakers truthmaking is a relation. The *relata* are truthmakers and truthbearers. The truthmakers may belong to different ontological kinds: ordinary particulars, tropes, states of affairs, properties. The truthbearers are typically thought of as propositions rather than sentences and belief tokens.

Truthmaking is a cross-categorical relation in the sense that it can obtain between entities belonging to different kinds: an entity that is not a proposition and a proposition. For instance, it allegedly obtains between Socrates and the proposition $\langle \text{Socrates exists} \rangle$. This cross-categoriality of

the truthmaking relation has been emphasised by Armstrong (2004, p. 6). But it is important to note that truthmaking is cross-categorical in the sense that it can obtain between entities belonging to different kinds, not in the sense that it must obtain between entities belonging to different kinds. Sometimes it obtains between things belonging to the same kind, i.e. between two propositions. For instance, the proposition <There is at least one proposition> is made true by the proposition <Philosophy is the noblest intellectual enterprise> (and, indeed, by the proposition <There is at least one proposition>). So truthmaking is cross-categorical in the sense in which set-membership is a cross-categorical relation: it can obtain between entities belonging to different kinds but it does not have to obtain between entities belonging to different kinds.

Truthmaking is not a causal relation (Armstrong 2004, p. 5). If one thinks of propositions as truthbearers and one thinks of propositions as abstract objects, then it is very plausible that truthmaking is not a causal relation, since causation is presumably a relation linking spatiotemporal entities and abstract objects are not spatiotemporal objects. But there is another reason why one may think that truthmaking is not a causal relation. This is that truthmaking is thought to be an internal relation but causation is an external relation.

What is an internal relation? There are at least two conceptions of internal relations. According to the more traditional one a relation is internal if and only if when it obtains between *a* and *b* it necessarily obtains between any entities having the same intrinsic properties as *a* and *b*. According to the other conception a relation is internal if and only if when it obtains between *a* and *b* it necessarily obtains between them if both of them exist. Causation is not internal in either sense.

There are independent reasons for taking propositions, as opposed to sentences and belief tokens, as truthbearers. But there is a specific reason that arises from truthmaker theory and specifically from the fact that truthmaking is supposed to be an internal relation. For such relations are either necessitated by its terms or by its terms' intrinsic properties. Take the sense of internal relation in which a relation is internal if and only if it is necessitated by the terms between which it obtains. But sentences and belief tokens do not have their contents essentially. The same sentence or belief token has different contents in different possible worlds. In those worlds they have different truthmakers, even if the actual truthmakers exist in such worlds. So the truthmaking relation is not internal if the truthbearers are entities having their contents accidentally. So, if the truthmaking relation is internal in the present sense, the truthbearers related by the truthmaking relation must be entities that have their contents essentially, and these are, typically, propositions, since propositions *are* contents. This argument for propositions as truthbearers is presented in David (2005).

Take now the sense of internal in which a relation is internal if and only if it necessarily obtains between entities having the same intrinsic properties

as those had by the things between which it actually obtains. It is plausible that sentences and belief tokens do not have their contents intrinsically. It is plausible that there are or there could be sentences and belief tokens with the same intrinsic properties as some actual sentences and belief tokens but with different contents. Those sentences and belief tokens have, or would have, different truthmakers. So, if the truthmaking relation is internal in the present sense the truthbearers related by the truthmaking relation must be entities that have their contents intrinsically, and these are, typically, propositions, since propositions *are* contents.

But some philosophers have admitted truthmaking while rejecting truthmakers (Lewis 2001, Dodd 2002, Hornsby 2005, Melia 2005). The idea is, basically, that true propositions are made true by how things are, not by whether things are. (This idea is usually expressed by saying that truth supervenes not upon whether things are but upon how things are (Lewis 1999a, Lewis 2001, Dodd 2002)). So, for example, what makes <The rose is red> true is not a certain entity, a red trope of the rose or a state of affairs that the rose is red, but how the rose is. How the rose is, namely red, makes the proposition that the rose is red true. In every world in which the rose is like it is, namely red, the proposition is true. But since how the rose is is not an entity, the proposition that the rose is red is made true without having a truthmaker. Against this it has been argued that how the rose is must be reified (Rodríguez-Pereyra 2005a; see Hornsby 2005 for a reply).

Melia (2005) claims that it is not necessary to think of truthmaking as a relation. He proposes to use the phrase ‘makes true’ as an operator, rather than a predicate, whose basic form is ‘A makes true proposition <P>’. For instance: *a* is red makes true the proposition <*a* is coloured> (p. 78).⁶ But ‘*a* is red makes true the proposition <*a* is coloured>’ is of dubious grammaticality. Grammar requires that a name be put to the left of the phrase ‘makes true the proposition <*a* is coloured>’, in which case truthmakers may have been re-introduced.

4. Truthmaker Maximalism

Do all true propositions have truthmakers? This is a point of contention and debate among truthmaker theorists. The thesis that all true propositions have truthmakers is known as *Truthmaker Maximalism*. Armstrong is the most conspicuous truthmaker maximalist, but he acknowledges not having any argument for it (2004, p. 7). Truthmaker Maximalism is normally rejected either because it is held that some true propositions like logical truths or even necessary truths in general have no truthmakers, since they are true no matter what the world is like, or because it is thought that no satisfactory account of the truthmakers for negative truths can be found (Simons 2005a).

Recently Peter Milne (2005) has proposed the following neat and nice argument against Truthmaker Maximalism. Consider (10):

(10) This proposition has no truthmaker.⁷

If (10) has a truthmaker, then it is true. And if it is true, it has no truthmaker, since that is what it says. So if it has a truthmaker, it has no truthmaker. So, by *reductio ad absurdum*, (10) has no truthmaker. But then (10) is true. So (10) is a truth without truthmakers. One way to block this argument would be to claim that there is no proposition like (10), that is, that the sentence to the right of '(10)' fails to express a proposition. Milne argues that such a course is unmotivated. (But see Rodriguez-Pereyra 2006 for a reply.)

But an argument has been proposed that supports something that comes close to Truthmaker Maximalism. This is the thesis that an important class of true synthetic propositions, which includes many inessential predications, negative existentials and necessary truths, have truthmakers. In its schematic form, the argument runs as follows (Rodriguez-Pereyra 2005a):

1. Truth is grounded.
2. Grounding is a relation.
3. Relations link entities.
4. Therefore, truth is grounded in entities.

The argument does not establish Truthmaker Maximalism because its first premise is meant to apply only to a significant class of true synthetic propositions. This argument has been resisted (Beebe and Dodd 2005, Hornsby 2005).

The issue of identifying the class of propositions with truthmakers promises to continue being an area of intense research among truthmaker theorists. A significant part of this research has concentrated on whether true inessential predications, true negative propositions, and true universal generalizations need truthmakers (see sections 5 and 7).

5. *The Ontological Cost of Truthmaker Necessitarianism*

Truthmaker Necessitarianism tends to make the postulation of truthmakers incur considerable ontological cost. Typically the truthmaker theorist cannot just believe in a world of ordinary particulars like tables, people, chairs, flowers, atoms and planets. This is because some true propositions about these particulars are contingent. Take an alleged contingent truth about a certain rose, say that <The rose is red>. Clearly, the rose itself cannot be the truthmaker for this proposition, since given that it is contingent that it is red, it is possible for the rose to be another colour. But if it is possible for the rose to be another colour, then the rose itself does not necessitate the truth of <The rose is red> and so it is not its truthmaker. Something additional seems to be needed to make the proposition that the rose is red true.

Some, like Armstrong, postulate states of affairs to solve this problem (1997, pp. 115–17). Thus, though the rose itself is not the truthmaker for the proposition that the rose is red, the state of affairs that the rose is red (a non-mereological complex entity somehow composed of the rose and the

property of *being red*) is the truthmaker for the proposition in question. And, indeed, the state of affairs that the rose is red necessitates the truth of the proposition that the rose is red: it is not possible for the state of affairs to exist and the proposition not to be true. This move adds to the ontology both properties, which Armstrong conceives of as universals, and states of affairs.⁸

But to postulate universals and states of affairs is not the only way to account for the truthmakers of true contingent propositions. If one postulates tropes (or modes, or particularised properties, as they are sometimes called) one can account for the truthmakers for contingent propositions provided the tropes in question are non-transferable, that is, provided that any trope that characterises a certain particular cannot characterise another particular. In that case tropes can be the truthmakers for the relevant propositions (Lowe 2006, pp. 205–7). For instance the rose's redness is the truthmaker for the proposition that the rose is red, and there is no conflict with Truthmaker Necessitarianism since it is impossible for the rose's redness to exist and the proposition that the rose is red not to be true.

But this does not mean that the truthmaker theorist must accept an ontology containing either universals or tropes. For there are ways for the truthmaker theorist to accept states of affairs within a nominalistic ontology, i.e. an ontology that contains neither universals nor tropes (Rodríguez-Pereyra 2002, pp. 85–7 accommodates states of affairs in the context of Resemblance Nominalism).

Different seems to be the case of true essential predications, that is, true propositions that state something essential of a certain particular, about which it is generally agreed that they do not require states of affairs as truthmakers. Indeed the particulars these propositions are about are normally taken as the truthmakers for these propositions. Thus, assuming that Socrates is essentially human, many would take Socrates himself to be the truthmaker for the proposition that Socrates is human (Bigelow 1988, p. 128, Lewis 1999a, p. 204). But although if essentially human Socrates himself necessitates the truth of the proposition that Socrates is human, it does not follow that Socrates himself is the truthmaker for the proposition that Socrates is human. Indeed what the proposition that Socrates is human seems to be true in virtue of is that Socrates is human, not just Socrates himself. Nevertheless there are other, more plausible, cases in which the truthmakers are particulars like Socrates (see section 6).

Still, it is theoretically possible to take the particulars that true inessential predications are about as their truthmakers. This is what David Lewis, who once did not believe in truthmakers for inessential predications (1999a, 1999b), proposed in his more recent work (2003). In order to account for the truthmakers for inessential predications in terms of particulars alone Lewis makes full use of his *Counterpart Theory*. How does Lewis use Counterpart Theory to account for the truthmakers for inessential predications in terms of particulars alone? First, note how Counterpart Theory allows Lewis to make sense of essentialism: *a* is essentially *F* just in

case all of *a*'s counterparts (including *a* itself) are F (Lewis 2003, p. 27). Very roughly put, Lewis's strategy is to identify something whose counterparts are all and only those counterparts of *a* which are F. Any such thing is essentially F and, more importantly, essentially such that *a* is F, and so, Lewis thinks, it may act as the truthmaker for the proposition that *a* is F. But what could be essentially such that *a* is F? Lewis's answer is: *a*. For a single thing enters into many different counterpart relations, to each of which corresponds an essence of the thing. So there is a counterpart relation under which all of *a*'s counterparts are F. And there is a counterpart relation under which all of *a*'s counterparts are G. Thus *a* has different essences under different counterpart relations (Lewis 2003, p. 31). Lewis introduces a name, '*a* qua F', to designate *a* but evoking the counterpart relation under which *a* is essentially F (2003, p. 31). So *a* qua F, that is, *a*, is the truthmaker for the proposition that *a* is F. Similarly, '*a* qua G' designates *a* but evokes the counterpart relation under which *a* is essentially G. So *a* qua G, that is, *a*, is the truthmaker for the proposition that *a* is G.

Since the elements of Counterpart Theory used here do not include or entail Lewis's realism about possible worlds, this is a solution to the problem of the ontological burden of truthmakers that might be attractive to many philosophers (e.g. those who think, erroneously in my view, that Lewis's realism about possible worlds imposes an intolerable ontological burden). Nevertheless, Lewis's relativisation of essences to counterpart relations is not an attractive feature of his proposed account of the truthmakers for inessential predications.

6. Truthmakers for Disjunctions, Conjunctions and Other Propositions

There is consensus in the literature that not every proposition has its own distinctive truthmaker. For instance, disjunctions are thought to be made true, *separately*, by the truthmakers for their true disjuncts. Thus if $\langle P \rangle$ and $\langle Q \rangle$ are true, $\langle P \vee Q \rangle$ is made true *both* by what makes $\langle P \rangle$ true and by what makes $\langle Q \rangle$ true. Thus there is no need to postulate a distinctive kind of entity, like *disjunctive states of affairs*, that is supposed to make disjunctions true (Mulligan, Simons and Smith 1984, p. 314).

This shows that the truthmaking relation is not one-one. A single proposition may have more than one truthmaker ($\langle P \vee Q \rangle$ may have two: the truthmaker for $\langle P \rangle$ and the truthmaker for $\langle Q \rangle$) and a single truthmaker may make more than one proposition true (the truthmaker for $\langle P \rangle$ makes true both $\langle P \rangle$ and $\langle P \vee Q \rangle$).

But even logically simple non-quantified propositions may have more than one minimal truthmaker (i.e. a truthmaker for a proposition none of whose proper parts is also a truthmaker for the same proposition). A nice example, given by Mulligan, Simons and Smith, is $\langle \text{Cyril has viral hepatitis} \rangle$. Since hepatitis comes in two sorts, A-hepatitis and B-hepatitis, if Cyril has both then the proposition that he has hepatitis is made true by the fact that

he has A-hepatitis and the fact that he has B-hepatitis. The claim that the proposition that Cyril has hepatitis is implicitly disjunctive can be resisted (Mulligan, Simons and Smith 1984, pp. 298–9).⁹

Thus if <Cyril has hepatitis> is atomic, then it has the same truthmakers as the disjunctive <Either Cyril has A-hepatitis or Cyril has B-hepatitis>. This exemplifies that propositions with different logical forms may have the same truthmakers and, *a fortiori*, truthmakers of the same ontological kind.

It is also agreed that conjunctions do not need their own distinctive kind of truthmakers and so a commitment to truthmakers need not lead to the postulation of conjunctive facts. For conjunctions are thought to be made true not by conjunctive facts but, *jointly*, by the truthmakers for the conjuncts. Thus what makes <P & Q> true are the truthmakers for <P> and <Q> *together* (Mulligan, Simons and Smith 1984, p. 313).

It is also commonly held that whatever makes a conjunction true makes its conjuncts true (Mulligan, Simons and Smith 1984, p. 316, Restall 1996, p. 334, Read 2000, p. 71, Armstrong 2004, p. 11). But Rodriguez-Pereyra (2005b) maintains that this is not so. <P & Q> may be true in virtue of a conjunctive fact that P & Q, or perhaps in virtue of the facts that P and Q together, but what <P> is true in virtue of is just the fact that P – the fact that Q being totally irrelevant to its truth, neither the conjunctive fact that P & Q (if it exists) nor the facts that P and Q together make <P> true.

Another point with respect to which there is general agreement is that existential generalizations do not need general facts as truthmakers. Existential generalisations are thought to be made true by whatever makes true their true instances or by states of affairs involving the entities the generalisation is about (Armstrong 2004, p. 55).

Singular existential propositions are usually thought to be made true by their subjects. Thus <Socrates exists> is made true by Socrates (Armstrong 2004, p. 23, Mulligan, Simons and Smith 1984, p. 300). There seems no need to postulate a fact of existence.

Again, the subject matter of a true identity sentence is generally thought to be its truthmaker. Thus Socrates is the truthmaker for <Socrates = Socrates> (Simons 1992, p. 163, Armstrong 2004, p. 39). But here it is common to recognise that alternative truthmakers may have to be recognised given that <Socrates = Socrates> may be true even if Socrates does not exist (Mulligan, Simons and Smith 1984, p. 301).

7. Truthmakers for Negative Propositions and Universal Generalisations

Perhaps the most pressing issue for truthmaker theorists is to account for the truthmakers for negative and universal generalisations. Let us consider negative propositions first. What can be the truthmaker for the true proposition that *a* is not red? The fact that *a* is not red? This answer was favoured by Russell (1918). But postulation of negative facts irritated the audience in Harvard when Russell postulated them and negative facts have

continued to find resistance among philosophers ever since. Part of the reason for this resistance might be that it is sometimes thought that negative facts are nowhere to be met with in experience (Demos 1917, p. 189) and that any knowledge or perception of an alleged negative fact seems to be derived from perception of a positive fact (Demos 1917, p. 189, Molnar 2000, pp. 79–80). There is also the general idea that whatever exists must be positive, sometimes reinforced by the considerations that whatever exists must be causally efficacious and that only what is positive can be causally efficacious (Molnar 2000, pp. 77–9). Finally, the nature and structure (if any) of negative facts seems to be very difficult to understand. Indeed, what kind of entity is the fact that *a* is not red? If facts are entities composed of particulars and properties, how do *a* and redness combine together to form the fact that *a* is *not* red? These are difficult questions for which no satisfactory answer seems forthcoming (cf. Molnar 2000, pp. 76–7).

Of course one might think that what makes true that *a* is not red is that *a* has the negative property of being *not-red*. But negative properties seem to have the same problems as negative facts.

Another solution, which can be traced as far back as to Demos (1917) and which tries to make do without negative facts, is the so-called *Incompatibility Solution*.¹⁰ According to this line of thought the truthmaker for a negative proposition is some positive entity that metaphysically excludes, or is metaphysically incompatible with, the proposition negated by the negative proposition in question. Thus the truthmaker for <*a* is not red> could be, for instance, the fact or state of affairs that *a* is green, since this fact is metaphysically incompatible with *a*'s being red and so necessitates the truth of <*a* is not red>.

This solution faces some problems. First, the solution requires that certain facts are incompatible with each other. So there are incompatibility truths. But these incompatibility truths are negative truths. Take, for instance, the truth that *a*'s being green is incompatible with *a*'s being red. What is its truthmaker? The theory should say that it is a certain fact that is incompatible with the compatibility of *a*'s being green and *a*'s being red. But what can such fact be if not the fact that *a*'s being green and *a*'s being red are incompatible? And what is this if not a negative fact? (This kind of objection against the Incompatibility Solution was advanced in Russell (1918).)

Another problem for the Incompatibility Solution is that it does not seem to work for every negative truth and, in particular, it does not seem to work for negative existential truths.¹¹ Consider a true negative existential proposition, like <There are no arctic penguins>. The problem here is that there seems to be no true affirmative proposition that is contrary to <There are arctic penguins>. And so there seems to exist no positive fact or states of affairs that is incompatible with there being arctic penguins.

A possible solution to this problem would be to postulate absences as truthmakers for negative existentials. This is what C. B. Martin (1996) does.

Martin argues that the truthmaker for the proposition that there are no arctic penguins is the absence of arctic penguins. This is a non-abstract, localized, first-order state of the world, as opposed to Armstrong's higher-order totality states of affairs (Martin 1996, pp. 59–60). But absences are as mysterious as negative facts, and many of the difficulties besetting the postulation of negative facts beset the postulation of absences as well.

Another solution is put forward by Lewis and Rosen (2003). They call the *Arctic*★ the Arctic together with everything in it: the bears, the moose, the walrus, the ice, the air etc. The Arctic★ qua containing no penguins is a truthmaker for the proposition that there are no arctic penguins (for Lewis on the 'qua' locution in this context see section 5 above). With respect to unrestricted negative existentials, like the proposition that there are no unicorns anywhere at any time, they propose as truthmaker the world qua lacking unicorns (Lewis and Rosen 2003, p. 40). This is an interesting but rather artificial solution.

Negative existential propositions are equivalent to universal generalisations, and it is normally assumed that they have the same truthmakers.¹² So the problem of accounting for negative existentials is the problem of accounting for universal generalisations. What are the truthmakers for universal generalisations? Consider the proposition <All men are mortal>. One might be tempted to think that the truthmaker for this proposition is a conjunction of individual facts about each man being mortal. That is, imagining that there are only three men, Charles, Julius and James, the truthmaker for <All men are mortal> would be the conjunction of the facts that Charles is a mortal man, that Julius is a mortal man and that James is a mortal man. But the problem with this is that this conjunction of facts fails to necessitate the truth of the proposition <All men are mortal>. For it is possible that Charles, Julius and James are mortal men and yet <All men are mortal> is false, due to the presence of an immortal man. Indeed the problem with universal generalisations is that the truthmakers for the conjunctions of their instances are not truthmakers for the universal generalisations themselves, and so we seem to be forced to postulate general facts, like the fact that all men are mortal, to account for their truthmakers.

No doubt general facts are *prima facie* as objectionable as negative facts. The main difficulty here seems to be to give a precise characterisation of their nature and structure. But Armstrong has given a clear and precise characterisation of their nature and structure. For Armstrong, who takes general facts to be truthmakers for both universal generalizations and negative existentials, general facts or totality state of affairs, as he calls them, are higher order states of affairs that consist of a certain aggregate (the aggregate of arctic animals, for instance) and a property (the property of being an arctic animal, for instance) standing in a certain relation, the *totalling relation* (Armstrong 2004, pp. 72–5). Thus the aggregate of arctic animals *totals* the property of being *arctic animal*. This account requires several ontological elements that will not be to the taste of every philosopher (universals, higher

order properties, etc.), but the point here is that it is a consistent, clear and systematic account of general facts or states of affairs.

Armstrong takes totality states of affairs to account not only for the truthmakers for universals generalizations and negative existentials but also for the truthmakers for negative propositions in general. For instance, the truthmaker for <Theaetetus is not flying> is the state of affairs that a certain collection of states of affairs (like *Theaetetus is speaking*, *Theaetetus is thinking*, *Theaetetus is walking*, etc.) are all the states of affairs in which Theaetetus is involved (Armstrong 2004, p. 58). That is, the truthmaker for <Theaetetus is not flying> is a state of affairs that consists of a certain aggregate of states of affairs totalling the property of being a state of affairs involving Theaetetus.

Is this a version of the Incompatibility Solution? Assuming that being an animal of a certain kind is essential, so that if something is a moose, a walrus or a polar bear it cannot be a penguin, the totality state of affairs that the actual aggregate of arctic animals totals the property of being an arctic animal is incompatible with there being any arctic penguins. But Armstrong's solution is not a version of the Incompatibility Solution because his totality states of affairs are a sort of negative fact (Molnar 2000, pp. 81–2, Armstrong 2004, pp. 58, 73). This is because a general fact is a 'no more' fact, a fact that there are no more things or states of affairs, or that there are no more things or states of affairs of a certain kind. More precisely, the totalling relation involves negation. It sets a limit to the entities that have a certain property. Since totality states of affairs are a sort of negative fact, Armstrong's solution is not a version of the Incompatibility Solution.

So what is the advantage, if any, of Armstrong's account? Ontological economy. A large number of negative states of affairs are replaced, in Armstrong's schema, by a large single totality state of affairs. Thus the single totality states of affairs that certain states of affairs are all the states of affairs in which Theaetetus figures acts as a truthmaker for the many negative truths about Theaetetus (Armstrong 2004, p. 58). But this advantage in economy can be an advantage for someone who already has decided that some sense can be made of negative facts or at least of a relation involving negation.

A completely different line is taken by Stephen Mumford, who is currently developing a solution to the problem of truthmakers for negative truths that consists in rejecting that there are any negative truths (Mumford 2005a, 2005b; for a reply see Simons 2005b).

According to Molnar negative truths represent a problem for truthmaker theory because there are some plausible theses that require that negative truths have positive truthmakers and it is difficult to see that every negative truth has some positive truthmaker (Molnar 2000, p. 85). One can simplify Molnar's point and identify the following three theses as those that jointly imply that negative truths must have positive truthmakers:

- (1) Everything that exists is positive.

- (2) Some negative claims are true.
 (3) Every true claim is made true by something that exists.¹³

One possible reaction to this is to reject some of these theses. Russell and Armstrong, among others, reject the first thesis. Mumford rejects the second. Simons and many others reject the third. Another possible reaction is to try to find positive truthmakers for negative truths. This is what Demos and Lewis try to do.

Finding truthmakers for negative truths and universal generalisations represent perhaps the most difficult problems for truthmaker theory. It is likely that these issues will be a focus of lively debate for as long as truthmaker theory remains an active research programme.

Notes

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¹ I follow the convention of using angled brackets to form names of propositions. So '<P>' stands for the proposition that P.

² A definition like this can be found, for instance, in Fox (1987, p. 189).

³ I have not found this definition in the literature but many suggest that *one* way of repairing truthmaking principles and solving problems in truthmaker theory is by using relevant logic (Armstrong 2004, p. 11, Restall 1996, p. 339).

⁴ What appears in Rodriguez-Pereyra (2002) is not (4) but the corresponding idea applied to sentences rather than propositions.

⁵ Lowe is not totally happy with this definition. He therefore provides a modified account to capture the notion of a truthmaker (2006, p. 210).

⁶ Melia uses sentences, not propositions, as truthbearers. But this is not relevant to the point I am discussing.

⁷ Milne uses the sentence 'This sentence has no truthmaker' in his argument. This difference is not significant in this context.

⁸ But Armstrong's new philosophy contains no contingent propositions about particulars having a certain property or being a certain way. So, for Armstrong, that contingent truths have truthmakers no longer affords a reason for postulating states of affairs. This does not mean that Armstrong now repudiates states of affairs. See Armstrong 2004, p. 49.

⁹ Mulligan, Simons and Smith take *moments*, not facts, to be truthmakers, and they take *sentences*, not propositions, to be truthbearers. But the lesson they give is general and can be applied if we take facts as truthmakers and propositions as truthbearers.

¹⁰ For the sake of historical accuracy it must be emphasised that Demos's intention was not to provide a theory of *truthmakers* for negative propositions. He was concerned with the meaning of such propositions and his proposal was that propositions like <it is not the case that p> *mean* something *like* <a proposition opposite to p is true> (1917, pp. 190, 194).

¹¹ It must be noted that Demos limited his analysis to singular negative truths, which he called 'particular' (1917, p. 188).

¹² Armstrong endorses what he calls the *Entailment Principle*, namely that if an entity is a truthmaker for a certain proposition <P> then it is also a truthmaker for any other proposition entailed by <P> (2004, p. 10). This gives a reason to think that negative existentials and positive universal generalisations have the same truthmakers. The Entailment Principle is rejected by the present author (Rodriguez-Pereyra 2005b). Nevertheless the assumption that these propositions have the same truthmakers is independently plausible.

¹³ Molnar has four theses, of which I have conserved the last three (and rewritten slightly the last two), since, it seems to me, the first of Molnar's theses is dispensable.

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