The trouble with truthmakers

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THE TROUBLE WITH TRUTH-MAKERS

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Abstract

This paper argues that theories of truth which seek to specify the ontological ground of true statements by appealing to an ontology of truth-makers face a severe and possibly insurmountable obstacle in the form of logically complex statements. I argue that there is no apparent way to develop an account of logically complex truth within the confines of a modest and plausible ontology of truth-makers and to this end criticize independent attempts by Armstrong and Pendlebury to develop such an account.

I

If a statement is true, then it seems that it should be true in virtue of something. One popular way of interpreting this claim is to say that for every true statement there is a thing which makes it true - its truth-maker. This thesis is often held in combination with ontological theses about the nature of truth-makers, and together they promise an account of what might be called the metaphysics of truth-making. I think that this promise has not been fulfilled and that it is far from obvious that it ever will be fulfilled. All theories of truth-making face an initial hurdle, that of making sense of logically complex truths. I argue that this initial hurdle is yet to be overcome and that
there is no apparent way for it to be overcome within the confines of a plausible ontology.

To argue the case, I examine two recent attempts to develop theories of truth-making for logically complex expressions. In section II I describe the task facing the truth-making theorist in general terms and in sections III and IV I examine truth-making theories advanced by Michael Pendlebury and David Armstrong respectively. Section V briefly summarizes the case against truth-makers.

II

First some assumed fundamentals. A theory of truth-making has to posit truth-bearers - things which are made true. Setting aside possible mental truth-bearers: thoughts, judgments, beliefs, etc., the most plausible truth-bearers for a theory of truth-making are statements. A statement is a sentence within a certain context, a context which specifies a language and whatever background features are necessary to discharge indexical elements of the sentence. A statement is the kind of linguistic object which has only one actual truth-value. In contrast to statements, sentences vary in truth-value from language to language and from speaker to speaker. Thus they are not made true simpliciter but only made true in a context. Since truth is the principal object of our present philosophical interest and not truth-relative-to-context, statements are the natural truth-bearers in a theory of truth-making.

Now the principle thesis of truth-making can be expressed as follows. For any statement s and any truth-maker t:
(T) If t makes s true, then the existence of t suffices for the truth of s.

A truth-maker *suffices* for the truth of the statement to which it corresponds and this relation can be interpreted in several ways: as a relation of necessitation between a truth-maker and a statement's truth; or as an entailment between two propositions - that a particular truth-maker exists and that a particular statement is true. Whatever the reading, a minimal condition for the satisfaction of (T) is that a truth-maker’s existence strictly imply the truth of the statement to which it corresponds. For a truth-maker to *make* a statement true it must not be possible that it exist while the statement fails to be true.

(T) requires supplementation with an account of the nature of truth-makers. They could be individuals (the truth-maker of ‘Socrates exists’ might be Socrates); universals (the truth-maker of ‘all mortals die’ might be mortality); or they might be facts (‘Socrates is mortal’ might be made true by the fact of Socrates' mortality). Indeed, anything may count as a truth-maker providing it satisfies (T) for some statement. There is no commitment implicit in (T) that every true statement have one and only one truth-maker or that truth-makers constitute only one type of entity. Truth is over-determined by truth-makers and it is quite conceivable that perfectly good theories of truth-making differ in their accounts of truth-makers, thus there is no obvious reason to embark on a search for the one true theory of truth-making.

A theory of truth-making nonetheless involves serious ontological commitment. Truth-makers must be things which exist. A theory of truth-making involving non-existent truth-makers is a false theory and a theory involving truth-makers which
cannot plausibly be said to exist is an implausible theory. Accordingly, the chief challenge for a truth-making theorist is to describe a class of entities which can plausibly be said to exist and which satisfies (T) for some interesting class of statements. It is very easy to satisfy (T) provided one is sufficiently liberal with one’s ontological commitments. If one were committed to the existence of abstract objects, vague objects, concrete possible worlds or infinite collections of negative and general facts, then the task of constructing a theory which satisfied (T) for a large class of statements would be relatively straightforward. On the other hand, if one restricted one’s attention to non-vague, unambiguous atomic statements, then the task of describing a modest ontology of truth-makers satisfying (T) would also be straightforward. It is much harder to see how one might satisfy (T) for a broad class of statements within the confines of a modest ontology.

One of the principal concerns here is the accommodation of logical complexity. Logically simple expressions are readily furnished with truth-makers, but truth-makers for logically complex expressions are harder to find. Disjunctions, negations, universal quantifications, indeed expressions of arbitrary extensional complexity, present an initial hurdle for all theories of truth-making. I shall argue that this hurdle is yet to be cleared. The two most promising recent attempts at the hurdle have been made by Michael Pendlebury and David Armstrong and I discuss them in sections III and IV respectively.

III

Russell made the initial attempt to clear the hurdle of logical complexity in 1918. His response to the problem was to adopt a very generous account of the
world's ontology - allowing negative and general facts to do service alongside atomic and conjunctive facts as ontological givens. Armstrong’s theory is a development of this line, discarding negative facts and attempting to motivate the idea that there exits a large class of general facts which serve as truth-makers for logically complex expressions. In contrast to this, Michael Pendlebury attempts to show that Russell's, and by implication Armstrong’s, extravagance in matters of ontology is unnecessary and that a satisfactory theory of truth-making can be developed with a very modest ontology of truth-makers - an ontology consisting of nothing but atomic facts and their aggregates. He does this by relativizing truth to worlds.

Pendlebury develops an account of world relative truth-making for the sentences of a standard first order language, \( L \). A logical space, \( K \), is defined as an ordered pair of a domain of individuals, \( D \), and a set of properties, \( P \), extending over the domain. A set of facts, \( S \), relative to \( K \) is the set of all tuples of the form \(<P, x_1, ..., x_n>\) where \( P \) is an n-place element of \( P \) and \( x_1, ..., x_n \) are all elements of \( D \). A fact is said to involve the individuals and properties of the corresponding tuple. On this basis we can define a possible world \( W \) as a subset of \( S \) whose members jointly involve every element of \( D \) (this constraint on possible worlds - that all individuals of a logical space are actual at every possible world - is dispensable, but convenient).

Atomic sentences of \( L \) specify facts in virtue of a function, \( M \), assigning elements of \( D \) to individual constants and elements of \( P \) to predicates. An atomic sentence of \( L \), \( Ft_1...t_n \), uniquely specifies the fact \(<M(F), M(t_1), ..., M(t_n)>\) and is true-in-\( W \) iff \(<M(F), M(t_1), ..., M(t_n)> \in W \).
An atomic sentence specifies a unique fact and is made true by the obtaining of that fact, however Pendlebury allows pluralities of facts to serve as truth-makers. Thus a collection of facts, s, makes an atomic sentence \(F_{t_1...t_n}\) true-in-\(W\) iff
\[\langle M(F), M(t_1), ..., M(t_n)\rangle \in s \text{ and } s \subseteq W.\]

This enables conjunctions to be neatly dealt with, viz. a collection of facts, s, makes the conjunction \(\phi \land \psi\) true-in-\(W\) iff s makes \(\phi\) true-in-\(W\) and s makes \(\psi\) true-in-\(W\). The introduction of quantifiers requires a refinement of the model's description which I overlook for the sake of ease of presentation, but the central feature of his handling of universal generalization, for example, is to have a sentence of the form \((\forall v)\phi\) specify the collection of facts corresponding to every possible assignment of an element of \(D\) to \(v\). Negations provide the most instructive example of how Pendlebury's theory works. The negation of an atomic sentence, \(\neg F_{t_1...t_n}\) is made true-in-\(W\) by a collection of facts s iff:

i) \(s \subseteq W\); and
ii) \(\langle M(F), M(t_1), ..., M(t_n)\rangle \not\in s\); and
iii) for some term \(t_m\) of \(\neg F_{t_1...t_n}\), s includes all facts in \(W\) involving \(t_m\).

The force of Pendlebury's suggestion about the truth-makers of negative sentences is best made clear by consideration of the simplest case, a negated 1-place atomic sentence, say \(\neg F_b\). \(\neg F_b\) is made true-in-\(W\) by a set of facts which includes all
the facts involving $M(b)$ provided that no such fact makes $Fb$ true. Roughly, ‘it is not the case that my office is inhabited by a polar bear’ is made true for us by all the facts involving my office. A negative existential sentence like ‘there are no unicorns’ is made true for us by all the facts of our world.

Truth-makers of atomic negations, therefore, are sets of actual logically simple facts, and the further development of the Pendlebury's theory provides a recursive procedure for distinguishing sets of logically simple facts as the truth-makers of arbitrarily complex sentences of $L$.

Pendlebury’s theory delivers an entailment between truth-maker and world-relative truth. If $s$ makes $\sim Fb$ true-in-$W$, then it does this at every world whether $s$ obtains at that world or not. He also achieves this within the confines of a modest ontology of atomic facts and their aggregates. Strictly speaking, however, the theory does not satisfy (T), it satisfies the following. For any truth-maker $t$, any sentence, $s$, of $L$, and any possible world $w$:

$$(T^*) \text{ If } t \text{ makes } s \text{ true-in-} w, \text{ then the existence of } t \text{ suffices for the truth-in-} w \text{ of } s.$$ 

Is this is a satisfactory theory of truth-making? A theory of truth-making is designed to answer questions such as: “what makes the English sentence ‘there are no unicorns’ true?” Pendlebury’s theory does not answer this question. Instead it answers the question: “what would make the English sentence ‘there are no unicorns’ (or its equivalent in $L$) true-in-$W$?” The answer he gives is $W$ itself, that is the set of
first order facts defining the possible world in question. However, the property of
being made true-in-\(W\) is not the property of being made true and is not this property
even if one happens to be in \(W\). To see this, it will suffice to observe that the mere
obtaining of the collection of facts \(W\) does not strictly imply the truth of the English
sentence ‘there are no unicorns’ even if one happens to assert this sentence in a world
exhausted by \(W\). This is because the mere obtaining of \(W\) does not make it
impossible for the statement that there are no unicorns to be false. \(W^*\), a world
identical to \(W\) save for the addition of one unicorn, is a possible world where \(W\)
obtains but the statement is false. By unrelativizing the concept of truth in this
fashion, we simply fail to satisfy (T). Thus \(W\), by itself, cannot make the statement
that there are no unicorns true. It cannot, by its mere existence, determine that there
are no unicorns.

Pendlebury, however, thinks that this feature of his theory is not quite the
drawback it might first appear. Granted, the same collection of facts could make a
sentence true in one world and false in another, but this is, he claims:

“...a small price to pay for the privilege of doing without negative and general
facts. For since worlds are themselves defined here as sets of atomic facts, the
relativization of the relation of making true to worlds demonstrably involves no
special new ontological commitments.”

Under what circumstances might the relativization of the relation of making true to
worlds not involve special new ontological commitments? Only in the circumstance
that the set $S$, that is the set of all possible first order facts, is constructed purely out of actual facts and the individuals and properties involved in them. This presupposes a strict combinatorialist account of modality since it restricts the realm of possible facts to recombinations of the components of actual facts. It thus involves denying the logical possibility of alien properties and non-actual individuals or at least makes their introduction into the set of possible first order facts extremely awkward. But even if we were to accept this consequence of Pendlebury’s theory and overlook the implausibly impoverished account of modality which appears to ensue, a major concern with the theory is still to be squarely addressed.

Perhaps the relativization of truth-making to possible worlds does not involve any special ontological commitment, but this does not end the story. We still require either some convincing reason to adopt a purely world-relative account of truth or some way to convert this relativistic account of truth into a fully-fledged account - one in which we determine an assignment of truth-makers satisfying (T) rather than (T*). Can we unrelativize Pendlebury’s theory of truth-making without introducing new ontological commitments? To stay within the bounds of Pendlebury’s ontology, we clearly need a way of augmenting his theory so that it satisfies (T) by utilizing no more that actual atomic facts and set-theoretic constructions out of them. But this cannot be done. The English statement “there are no unicorns”, for example, is made true-in-$W$ by $W$. A fully-fledged truth-maker for the statement, then, will be $W$ augmented by the fact that $W$ is the actual world - the world in which English is actually spoken. This latter fact is no more and no less than the fact that $W$ is the totality of all first order actual facts. But how does one introduce a fact of this kind
without making special ontological commitments? No set-theoretic construction out of first order facts will amount to the fact that $W$ exhausts all the actual facts.

Pendlebury wards off a related criticism of his theory with the perfectly correct observation that truth-making is an ontological and not an epistemological matter.\textsuperscript{6} One consequence of his theory is that one could be perfectly aware of all the facts making a particular negative or general statement true without knowing that it was true. This may seem an unwelcome consequence of a theory of truth, but it is not after all the business of a theory of truth to lay down the conditions under which a person can be said to know whether particular statements are true or not. It is enough that we set out the conditions which make them true.

This is quite right, but consider the example of unicorns once more. Exactly what might be lacking in someone who knows all the facts making it true on Pendlebury’s theory that there are no unicorns? One would know each of the facts collected in $W$, but would lack the knowledge that these are all the facts there are to collect. Now this is certainly an epistemological consequence of the theory, but it is not a mere epistemological consequence. The missing epistemic element is knowledge of a condition which must obtain for the statement that there are no unicorns to be true. It would be a mere epistemological failure if the lack reflected on the knower’s own condition - that she lacked relevant awareness, or failed to draw an appropriate inference, or was not in the right justificatory state, etc. Instead, this lack refers to a genuine gap in her appreciation of what is required to make it true that there are no unicorns. Pendlebury suggests that it was a confusion between the ontological and epistemological tasks facing the philosopher which led Russell to posit general and
negative facts. The idea seems to be that Russell discovered an epistemological hole and tried to fill it in with ontological paste. This isn’t quite right, though. The hole Russell discovered - that one doesn’t know all the facts until one knows that all the facts one knows are all the facts - isn’t purely epistemological. It also bears directly on what is required to make general and negative statements true.

What other reason might one have for resting content with a theory of truth-making such as Pendlebury’s? I think the key to answering this question lies in the character of truth-bearers. Pendlebury employs sentences of a formal, but interpreted, language as truth-bears. These sentences are not bound to any particular possible world, so the one sentence can vary in truth-value from possible world to possible world. This is surely how it should be. We should be able to employ the one sentence when making claims about what is the case, what might have been the case, and what might yet be the case. There is little communicative value in a sentential expression which cannot be imported into modal contexts in order to achieve this effect and a theory of truth-making which narrowed its attention to such expressions would be of restricted interest. Notwithstanding this reservation, imagine that we employ world-bound statements as truth-bearers. Perhaps we identify statements with world bound particulars, say acts of assertion, or perhaps we tie their identity to their modal context in some other way. In any case, the truth-value of world bound statements will be determined purely by the first order facts of the world to which they are bound. For example, an actual world assertion of the sentence ‘there are no unicorns’ is made true by $W$. There is no need to augment $W$ with a fact determining that $W$ is the totality of first order actual facts, providing that any world in which $W$
is not such a totality is taken to be a world in which the assertion is simply not made. An assertion of ‘there are no unicorns’ in $W^*$ would be a different particular act, and the fact that it would be false does not bear upon the credentials of $W$ as the truth-maker of a corresponding actual world assertion.\(^8\)

A theory of this kind requires another modification of (T). Instead of saying that the existence of a truth-maker suffices for the truth of its corresponding statement, (T) must now read, for any statement $s$ and any truth-maker $t$:

\[(T^{**})\text{ The existence of } t \text{ precludes the falsity of } s \text{ and the truth of } s \text{ guarantees the existence of } t.\]

On this account of truth-making, one can readily see how epistemological and ontological issues may become confused. If I am aware of each of the facts collected in $W$, but not aware that $W$ makes my assertion of ‘there are no unicorns’ true, it is because I am not fully informed about the nature of my assertion. In particular, I am not fully informed about its modal context and thus not fully informed of its identity. I am, after all, in no position to distinguish between an assertion of ‘there are no unicorns’ in $W$ from its assertion in $W^*$ and this seems to be an epistemological rather than ontological failing.

A theory of truth-making for world bound statements, statements whose identity is tied to their modal contexts, can thus make do without the ontological extravagance of general or negative facts. There are a number of unsatisfactory features of this kind of theory, however. First, it fails to do full justice to the idea that facts make
statements true. Weakening (T) to (T**) means replacing the idea that truth-makers determine truth with the idea that truth-makers determine either that a statement is true or that it could not be made (i.e. could not be made in that particular modal context because of the identity condition placed upon statements). A truth-maker, then, would not make a statement true, it would only make it conditionally true: true on condition that it can be made. But the conditions under which a world bound statement can or cannot be made are determined by its modal context, ultimately by the totality of first order facts which obtain at the world at which it is made. Thus truth-makers for general or negative statements link the truth of statements to the totality of obtaining facts. They only make it true that if a certain facts of totality were to obtain, then a particular negative or general statement would be true. This, it seems to me, is no real advance.

Another major failing of such a theory, already mentioned, is that world-bound statements of this kind do not make satisfactory truth-bearers. This is not only because such truth-bearers are not readily imported into modal contexts, but also because they fail to deliver on the fundamental requirements of a theory of truth-making. We are after a theory of truth-making which explains how the truth-value of sentential expressions is determined by the facts and this involves explaining how their truth-value would vary as the facts varied. On the world-bound theory, however, we are precluded from any such explanation because we have artificially restricted the identity of truth-bearers.

Neither Pendlebury’s theory of truth-making nor the discussed variations upon it are satisfactory. In each case the theory fails because it fails to acknowledge an
essential component of truth-making - that determining the truth of negative and general statements. It seems to me, therefore, that a full-blooded theory of truth-making will require either general facts or negative facts or both. The trouble is that it is very hard to make ontological sense of these kinds of facts. The most sustained recent attempt to do so is David Armstrong’s and it is to this attempt that I now turn.

IV

Armstrong's strategy works in two stages. In the first stage general facts are analyzed in the hope of showing them to be satisfactory elements of a moderate ontology, and in the second stage it is shown that truth-makers of arbitrarily complex statements, including negative and general statements, are to be found within this ontology.

I shall discuss the second stage of his strategy first. Imagine that we have at our disposal a broad range of general facts, or as Armstrong calls them facts of totality. Corresponding to a particular set of red things we have a fact making this set the set of all red things; corresponding to a set of properties possessed by an individual we have a fact making this the set of all properties possessed by the individual; and corresponding to a set of facts we have a fact making this set the set of all facts; etc.

I have already suggested that Pendebury’s theory of truth-making can be augmented by facts of totality so that it satisfies (T). Armstrong’s approach is somewhat different. Again, it is convenient to illustrate the theory by describing how simple negations are modeled. The negation of an atomic sentence, ~Fb, is assigned a truth-maker by an indirect method. Say that \( P \) is a set of all the world's first-order properties, that \( P \in P \), and that \( M(F) = P \). Then, according to Armstrong, ~Fb will be
‘equivalent’ to an exhaustive disjunction each of whose disjuncts claims a set of properties not involving P as the totality of b’s properties. For example, if the world contained only three first-order properties P, Q, and R, then \(~Fb\) would be ‘equivalent’ to the claim that either \{Q\} is the totality of b's properties, \{R\} is that totality, or \{Q,R\} is that totality. With facts of totality at our disposal, a truth-maker for this disjunction can be found - it will be the truth-maker of the disjunction's one true disjunct. Since the disjunction is ‘equivalent’ to \(~Fb\), the truth-maker of one will be the truth-maker of the other, so the truth-maker of this one true disjunct will be the truth-maker of \(~Fb\).

Call the disjunction assigned a negated atomic statement in this way its Armstrong equivalent. It is not obvious that a negation and its Armstrong equivalent are strictly equivalent. Armstrong thinks they are, calling the equivalence a ‘Kripkean necessity’ (i.e. a necessity which must be discovered \(a\ posteriori\)), but his reason for thinking this turns on his acceptance of a strict combinatorial account of modality.\(^{10}\) According to this account, if P, Q, and R are all the properties of the actual world, they are the only properties instantiated at any possible world. There can be no alien properties or non-actual individuals. In section III we saw that a rejection of alien properties and non-actual individuals is implicit in Pendlebury’s theory. It is a highly controversial claim and not one to which the combinatorialist is likely to hold fast.\(^{11}\) A denial of alien properties, for instance, appears highly counter-intuitive, amounting to the claim that the world could not really have had properties other than those it has. Indeed, the counter-intuitive nature of this claim has been one of the most forceful
considerations in favor of modal realism, but one need not be a modal realist to find it unacceptable.

Luckily there is a way of modifying Armstrong's strategy so as to avoid this commitment. Armstrong's strategy is to find, for any negation of an atomic statement, a corresponding Armstrong equivalent whose truth-maker can serve as the truth-maker of the negation in virtue of the strict equivalence between negation and Armstrong equivalent. This relies on the principle that a truth-maker makes true, not only the statement which specifies it, but all strictly equivalent statements. However, (T) requires only that a statement's truth be strictly implied by its truth-makers existence. Thus we can require less of an Armstrong equivalent. It is enough for our purposes if an Armstrong equivalent strictly implies the negation to which it corresponds.

We can readily modify our account of Armstrong equivalents to achieve this result. In the example above, where \{P,Q,R\} is the totality of the world's properties, the Armstrong equivalent of \(\neg Fb\) is a conjunction of two claims: one that either \{Q\}, \{R\}, or \{Q,R\} is the totality of b's properties; and the other that \{P,Q,R\} is the totality of the world's properties. At every world where this Armstrong equivalent is true, \(\neg Fb\) is true, so whatever makes the Armstrong equivalent true makes \(\neg Fb\) true. Of course, if \{P,Q,R\} is not the totality of the world's properties, the Armstrong equivalent of \(\neg Fb\) will not be the conjunction described above. But if \(\neg Fb\) is true it will have an Armstrong equivalent - we need not know what it is - whose truth-maker will be the truth-maker of \(\neg Fb\).
Armstrong's strategy is a little cumbersome. For instance, it involves the assumption that either our language contains names for every property or that a language naming every property exists into which our logically perfect utterances can be translated. A detour via the claim that an Armstrong equivalent exists for every negation of an atomic sentence is a useful way of motivating the suggestion that truth-makers for negated atomic sentences can be analyzed entirely in terms of facts of totality, but it is dispensable. Given a sufficiently rich metalanguage, one in which we can quantify over facts of totality, we can develop an Armstrongian model of complex truth-makers directly. If p is the fact determining the totality of the world's properties, then \(~Fb\) is made true by a collection of facts s iff:

i) \(s = s^* \cup \{p\}\);

ii) \(s^*\) includes all facts of totality involving \(M(b)\);

iii) no element of \(s^*\) involves \(M(F)\).

This theory can be extended to accommodate all non-vague, first order expressions since any such expression will be logically equivalent to a sentence in prenex disjunctive normal form and a recursive procedure for assigning potential truth-makers to each of its prenex disjuncts is readily furnished.

To complete Armstrong's account of logically complex truth-making we need to show that it appeals to plausible ontology of truth-makers, i.e. that the supposition that there are facts of totality is plausible. In keeping with his account of atomic facts, Armstrong provides a combinatorial analysis of facts of totality. They are analyzed in
terms of their components: particulars and aggregates of particulars, properties and relations. A fact of totality is a fact which obtains of a collection. It is the fact which obtains when the collection is an exhaustive collection. Armstrong argues, however, that this exhaustiveness cannot be a straightforward property of the collection because every exhaustive collection would instantiate a different non-repeatable such property. Nor can it be a relation between a collection and something outside it, since the collection of all things is exhaustive and there is nothing outside it for it to be related to. Rather, according to Armstrong, a collection's being an exhaustive collection, or a totality, involves its being in a kind of internal relation. This relation - called the T-relation - relates a collection to the property of being a member of that collection. For instance, the collection of all red things is T-related to the property of being red. Its being so related makes it true that the collection exhaustively collects all red things.

In our example above, where the world contains just three first order properties P, Q, and R, say that b has only Q and R as properties. Then this fact is modeled by \( <T, \{Q,R\}, b^*> \), where T is the T-relation and b* is the property of being a property of b. The world's involving only the three properties P, Q, and R is a fact modeled by \( <T, \{P,Q,R\}, p^*> \), where p* is the property of being a property instantiated in the world. On the modified Armstrong account of negation, \(~Fb\) would be made true by an actual state of affairs modeled by \{\( <T, \{Q,R\}, b^*>\), \( <T, \{P,Q,R\}, p^*>\)\}.

Now, to the uninitiated, a fact of totality may look for all the world like it conceals a logical complexity. To say that some collection C of red things is the set of all red things is to say something to the effect that, of all things, there is nothing red
which is not a member of this set. This could be expressed as either: \( \neg(\exists x) \) x is red & \( x \not\in C \); or \( (\forall x) \) x is red \( \rightarrow x \in C \); or some equivalent logically complex formulation.

One might conclude that facts of totality should exhibit the same logical complexity, and this is something Armstrong's analysis singularly fails to do. The complaint does not do justice to Armstrong's suggestion, however. If ontological sense can be made of facts of totality, there is nothing to stop them being used as the truth-makers of logically complex statements. All that follows from this is that certain logically complex statements manage to specify facts without there needing to be a recursive characterization of the specification. The semantic question of how they manage to do this is deserving of an answer, but let us proceed on the assumption that such an answer is in the offing.

So how much ontological sense do facts of totality make? One could query the elements out of which Armstrong proposes to construct his model of facts of totality, but it is best to attend directly to the most problematic instance of a fact of totality. This is the most general fact - the meta-fact making a set of facts a set of all the world's facts. Armstrong is willing to embrace a fact of this kind, however, on pain of introducing something akin to impredicative circularity into the account, he cannot include this meta-fact within a set of facts constituting the world.\(^{11}\) If it were to take its place alongside the ordinary facts of the world, the fact that these are all the facts would be a fact in part about itself. On the combinatorial account of facts developed above this is nonsense, and the combinatorial account of facts is the best on offer.\(^{12}\) The alternative seems equally unpalatable. This involves the hypothesis of an infinite hierarchy of meta-facts, each one totaling a prior collection of facts.
Armstrong opts for the hierarchy, claiming that it need not be treated with ‘ontological seriousness’ because it is trivial.\textsuperscript{13} The initial meta-fact of totality, that totaling all atomic facts, is not trivial, but the ensuing regress is and Armstrong gives an account of this triviality in terms of possible world supervenience. For any set of atomic facts there are possible worlds sharing these facts yet differing as to the general facts of totality (i.e. one possible world contains more atomic facts than the other), but any two worlds sharing atomic facts and initial facts of totality will share all facts of totality, indeed will be indistinguishable.\textsuperscript{14}

Grant Armstrong this point. A regress of facts of totality is, in a certain sense, trivial. But the sense in which it is trivial is not an ontological sense. Ontological seriousness begins and ends with claims about what exists and Armstrong is forced to make just such a claim. If a fact about the totality of all first order facts is said to exist, a hierarchy of facts must be said to exist, each member of which is supposed to be a distinct element of the world. These new posits may be trivially uninformative, but the fact that we introduce infinitely many of them into our ontology is not a trivial matter.

It is very hard to see how the supervenience of higher order facts of totality on an initial fact of totality limits the ontological seriousness of the commitment or how this supervenience relation entitles one to an ontological ‘free lunch’. Consider a parallel situation with respect to epiphenomenal particles. Imagine an ontology in which every material particle in the world was accompanied by a corresponding epiphenomenal particle, and every epiphenomenal particle accompanied by a corresponding super-epiphenomenal particle, and so on. Now imagine that the entire
hierarchy of epiphenomenal particles supervenes on material particles. One would not be tempted to consider the ontological cost of epiphenomenal particles mitigated by this supervenience. If anything, the fact that epiphenomenal particles supervene on material particles makes their introduction into a fundamental ontology all the more awkward. The same must surely go for higher order facts of totality. Since they are to be introduced into a fundamental ontology, the fact that the each higher order fact of totality is determined by the lower order fact of totality does not effect the ontological seriousness of their introduction.

Supervenience relations are used in many other contexts in the attempt to limit ontological commitment. If mental states supervene on physical states, for example, then their may be no need to introduce special mental objects into one’s basic ontology. However, the supervenience relation mooted by Armstrong is a relation within ontology. It says that there exist higher order facts of totality and these supervene upon initial facts of totality. But this merely affirms that where you have a commitment to initial facts of totality, a commitment to higher order facts of totality follows in its train. One cannot use a supervenience relation of this kind to reduce the seriousness of one’s ontological commitments, as my analogy with epiphenomenal properties is designed to illustrate.

The analogy to epiphenomenal particles certainly has limitations. There seems to be no work for epiphenomenal particles to do whereas Armstrongian facts of totality enable us to furnish negative and general statements with truth-makers. But my point is primarily an economic one. Armstrongian facts of totality bear a hefty ontological
cost, a cost which is not mitigated by their supervenience on the totality of first order facts.

Perhaps Armstrong was led to underestimate the ontological import of a hierarchy of facts of totality by an equivocation over various senses of ‘fact’. For example, a corresponding hierarchy of true statements may be thought trivial in some sense, and one might adopt a sanguine attitude towards an appeal to such a hierarchy, perhaps in the way appeals to a Tarskian hierarchy of metalanguages have sometimes been taken. But a hierarchy of ontological givens rudely inflates our ontology, and a theory of truth-making quantifying over them will find it extremely difficult to satisfy demands for ontological plausibility.

Armstrong, therefore, does not make a convincing case for the introduction of a fact determining the totality of first order facts into his ontology. Notice, however, that despite Armstrong's acceptance of higher order facts of totality, the modified Armstrong theory developed here does not make explicit mention of them. According to Armstrong, the truth-makers of logically complex first order expressions are to be found within a rich ontology of facts of totality - facts determining the totality of an individual's properties and facts determining the totality of the world's properties. But these facts do not suffer from the impredicative problems associated with facts totaling facts, so Armstrong was perhaps unwise to introduce facts totaling facts into his ontology in the first place. Though the modified Armstrong theory of logically complex truth-making makes no explicit mention of facts totaling facts, the theory may still make implicit use of them and the initial plausibility of the theory will depend on whether or not it does so. To decide the matter we must turn our attention
to the metalinguistic resources needed to state the modified Armstrong theory. These include the capacity to quantify over all facts of totality. \(~F_b\) is made true by a collection of facts which includes all facts of totality involving \(M(b)\). The metalinguistic claim that there exists a collection of facts satisfying this condition itself needs to be true, and thus needs a truth-maker. But how does one make true a claim quantifying over facts of totality without invoking a fact determining that a certain collection of facts of totality is exhaustive? But appeal to such a fact brings with it the same ontological burden as an appeal to the fact totaling all facts. A fact totaling all facts of totality is itself a fact of totality, and cannot, on the combinatorial account of facts assumed by Armstrong, be a fact included in itself. It will thus generate an infinite hierarchy of facts supervening on its initial member. The Armstrong model thus relies implicitly on a hierarchy of higher order facts and Armstrong was quite right to address the question of their ontological plausibility directly. I have argued that he does not do so successfully.

The ontological inflation which Armstrong’s theory exhibits makes the reduction of negative and other logically complex facts to atomic facts and facts of totality appear arbitrary. What is gained by the reduction of one class of facts to another of at least equal, possibly greater, ontological significance? An ontology which includes negative facts seems no less plausible than an ontology which includes an infinite hierarchy of facts of totality, and so the preference Armstrong shows for facts of totality at the expense of negative facts seems arbitrary.

In his most recent discussion of this matter,\(^{15}\) Armstrong appears to recognize the difficulty such a hierarchy of meta-facts has placed him in. His solution, only sketched
in the broadest outline, is to suggest that facts of totality do not actually exist, but are mere possibilities. They are what Armstrong now calls ‘non-empirical states of affairs’. The new move appears to me to represent an effective abandonment of the truth-making project. That \( W \) is the totality of all facts is now made true by something non-existent.\(^{16} \) It therefore isn’t made true by the announced standards at all. Nor, as a consequence, are logically complex statements made true. Armstrong’s earlier instincts were certainly truer to the truth-making project, but in his hands that project turned out to bear extraordinary ontological costs.

There are at least two possible strategies for rescuing Armstrong’s project. The first involves allowing circular (and thus non-wellfounded) facts of totality into our ontology. The second involves finding independent reasons to accept an infinite hierarchy of meta-facts. I shall briefly discuss both strategies, though limitation of space prevents a fully adequate discussion of either.

A circular fact of totality would be one which determines that some totality of facts of which it is itself a member is the totality of all facts.\(^ {17} \) What principled reason might one have to reject such a fact? Armstrong clearly has a preference for wellfounded fact construction, but without an argument this may be little more than a conservative preference for wellfounded set theory. A comprehensive defense of wellfounded fact construction would require a clearer and better motivated account of the relation between facts and their constituents than is presently on offer. However, one general line of defense can be given without extensive consideration of the internal constitution of facts. This involves defending the ontological plausibility of wellfounded as opposed to non-wellfounded set theory. Non-wellfounded set theory
is a remarkably useful tool for the description of information flows and thus has a ready place within situation semantics, however its value a descriptive tool in ontology is doubtful. From the point of view of the truth-making theorist, there is little to be gained in positing an ontology of facts if it turns out that facts are ontologically suspect abstract objects. But ontologically suspect abstract objects are exactly what non-wellfounded set theoretic constructions are likely to be. By contrast, a plausible account of the ontology of well-founded set theory is within sight. This is one based on mereology and in it sets are taken to be fusions of subsets. Singular subsets, or singletons, are left to be explained somehow or other. One consequence of the mereological approach to set theory is that circular sets are ruled out - an object cannot have itself as a proper part. Thus one cannot use these sets to describe an ontology of circular facts of totality. Unless an equally plausible ontology for non-wellfounded set theory can be found, circular facts of totality must remain ontologically suspect.

A better strategy for the rescue of Armstrong’s theory of truth-making may be to find independent reasons to believe in the ontological reality of a hierarchy of meta-facts. And the best way to achieve this may be to find other explanatory work for the hierarchy to do. At present, the argument seems to run as follows. The best explanation of the truth of negative and general statements is their being made true by a rich ontology of facts of totality, including a hierarchy of meta-facts of totality supervening on an initial such fact. My response is to claim that this is anything but the best explanation of logically complex truth because a commitment to an infinite hierarchy of meta-facts bears a quite extraordinary ontological cost. However, if other
explanatory work can be found for the hierarchy, then the cost of this commitment would be spread, so to speak, and the inference to the best explanation would gain in plausibility.

The challenge, then, is to discover this explanatory work. I suspect that the only likely place to find it is in the explanation of mathematical truth. According to the metaphysical picture Armstrong draws, the world comes structured into a ready made, infinite hierarchy of facts. This is just the kind of structure one needs to explain the truths of at least wellfounded set theory in straightforward realist fashion. Armstrong has introduced a conception of a world which may turn out to be large enough for mathematical truth, but it is a moot point whether the explanatory value of this conception can compensate for the elephantine size of its ontology.

V

There is a tension which pervades attempts to develop theories of truth-making and which is nicely illustrated by the contrast between Pendlebury and Armstrong. This is the tension between a need to capture something approaching the full force of our intuitive concept of truth on the one hand and a need to do so without ontological excess on the other. Pendlebury, I have argued, fails to satisfy the first of these needs and Armstrong fails to satisfy the second. The trouble with truth-makers is that there appears no way to satisfy both needs at once. In particular, theories of truth-making fail to account for logically complex truth within the confines of a plausible and modest ontology. This does not, of course, amount to a refutation of ambitious and
general truth-making theories, however the prospects for any such theory appear to me to be dim.
REFERENCES


1 Armstrong [2] and Pendlebury [8]

2 In what follows I shall restrict my attention to truth-makers of literal, non-vague and unambiguous expressions.


8 Such a view of truth-bearers may lie behind Simons’ very similar claim that truth-makers for negative sentences are no more than and no less than the actual world. [11] p159.

9 Armstrong [2] pp. 92-97. In an earlier work, [1], Armstrong offered a different solution to the problem of negative truth-makers which I shall not examine. It involved a special kind of correspondence - counter-correspondence - held to exist between a proposition and a state of affairs which it does not specify, but which involves its subject. The attempted solution in [2] appears to me to be a marked advancement on this earlier solution.

11 Armstrong, for example, argues in [2] that alien properties and objects are, unlike other modalities, mere “conceptual possibilities”. This is subsequently taken back in [4].

12 Armstrong refers to the paradox of totality in describing this situation ([2] p. 94), but strictly speaking there is no such paradox. Armstrong is relying on the impossibility of constructing circular facts of totality within wellfounded set theory. I discuss the prospects for non-wellfounded facts below.


14 In more recent terminology, Armstrong would describe these meta-facts as “third-class states of affairs” [4] p626. The change of terminology, however, does not alter the fundamental question, which is whether ontological sense can be made of them.


16 More accurately, these truth-makers are non-actual, but given Armstrong’s insistence that everything non-actual is merely fictional, the non-existence of such truth-makers follows.

17 Such facts have been extensively studied in situation semantics, particularly by Jon Barwise. However, it would be a mistake to apply automatically Barwise fact construction to the case in hand. Barwise is at odds with Armstrong’s truth-maker project at many points. In particular, Barwise distinguishes between situations and facts, where situations are parts of the world and facts are abstract objects emerging out of the cognitive interaction of inquirers and their
environments, see [5] pp. 221-28. The ontological status of Barwise facts is unclear. Certainly they are not promising elements out of which to construct a realist hypothesis of the world’s fundamental ontology.

18 This is attempted, for example, by David Lewis in [7]. Armstrong attempts an ontological reduction of singletons in [3].

19 This would be a competitor to the attempted mereological account of set theory in [3] and [7]. However, it may be all the more valuable for that. Rosen [9] has demonstrated that Armstrong’s account of singletons breaks down and it is not yet clear whether a modified version of the theory can escape paradox. Armstrong outlines one possible line of response in [4], but this, I argue above, involves an effective abandonment of his theory of truth-making.