# Impossibilists' Paradise on the Cheap?

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ABSTRACT: The aim of the paper is to discuss the ersatz theory of Lewis's impossible worlds, point out its undeniable benefits and demonstrate its costs. Firstly, I present two approaches to Lewis's impossible worlds taken as constructions out of possibilia. Secondly, I evaluate the proposals using the Lewisian criteria of success concerning the well defined conception of analysis. Although appealing, I do not find the proposals fully persuasive. Thirdly, I discuss the objection from an ad hoc distinction between possible and impossible worlds. I conclude that the objection does not present a special problem for the Lewisian theory. Finally, I motivate a theory of extended modal realism, to wit, modal realism enriched with concrete impossibilia.

KEYWORDS: David Lewis – modal realism – impossible worlds.

## 1. Introduction

Notoriously, David Lewis's theory of possible worlds[1] raises a lot of objections. Besides the incredulous stares on the side of 'common sense' readers, it was argued that it cannot account for phenomena concerning impossible matters. It is because of the fact that, according to Lewis, if we sup-

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[1] For the full and comprehensive exposition of modal realism, see Lewis's *magnum opus* (1986).

posed that there is an impossible world, and given the fact how his theory of modality works, we would get a plain contradiction.[2]

It is, therefore, not a surprise that any advocate of the Lewisian conception of analysis either a) denies the impossible phenomena, b) postulates concrete impossible worlds at the cost of true contradiction in the actual worlds or c) combines the Lewisian approach to modality with the *ersatzist* project, taking possible and impossible worlds as construction out of possibilia of one sort or another. In what follows, I scrutinize the *ersatz* theory of Lewis's impossible worlds and discuss their pros and cons. Finally, I motivate a theory of extended modal realism, the theory that takes the extension of modal realism by impossible worlds seriously.

## 2. Impossible worlds: Why bother with them?

In his *Counterfactuals*, David Lewis formulates an argument according to which

> [i]t is uncontroversially true that things might have been otherwise than they are. I believe, and you do so, that things might have been different in countless ways. But what does that mean? Ordinary language permits the paraphrase: there are many ways things could have been besides the way they actually are. On the face of it, this sentence is an existential quantification. It says that there exist many entities of a certain description, to wit, 'ways things could have been'. I believe things could have been different in countless ways. I believe permissible paraphrase of what I believe, taking the paraphrase at its face value. I therefore believe in the existence of entities which might be called 'ways things could have been'. I prefer to call them 'possible worlds'. (Lewis 1973, 84)

The argument states at least two things. One of them is the fact that we believe in the ways the world, our actual world, might have been. The other thing is that the ways at issue are entities of some sort or other over which we quantify. If we agree with Quine (1948) and accept that to be is

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[2]   Since, for Lewis, worlds are 'are not like stories or story-tellers... They are like this world; and this world is no story, not even a true story', 'at so-and-so world' is a restricting modifier working in the same way as the modifier 'in Bratislava', does. See Lewis (1986, 7, fn. 3).

to be a value of a bound variable, modal notions are to be understood as quantifications over *concrete*[3] entities – possible worlds.[4]

## 3. The second argument and dilemma

However, we can ask, while accepting Lewis's argument from ways, why should we not accept a similar argument for the existence of impossible worlds, namely 'ways the world *could not* have been'? The argument, as it goes, is a variant of the argument from ways obtained by replacement of possibility terms (could, might, possible) with corresponding impossibility terms (could not, might not, impossible). Thus, reformulating the argument, we have:

It is uncontroversially true that things could NOT have been some ways. Thus, there exist many entities of a certain description, to wit, '*ways things could NOT have been*'. I believe things could NOT have been different in countless ways. I believe permissible paraphrase of what I believe, taking the paraphrase at its face value. I therefore believe in the existence of entities which might be called '*ways things could NOT have been*'. I prefer to call them '*im*possible worlds'.[5]

Given Lewis's original argument for the existence of possible worlds, there seems to be no principal difference when applied to impossibilia.[6] But then, a dilemma arises: either we accept Lewis's argument from ways for

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[3] According to Lewis, concrete entities are a) things like donkeys and puddles and protons and stars, rather than entities like numbers; b) individuals rather than sets, particulars rather universals; c) they have spatiotemporal location, enter into causal interaction, are indiscernible one from another and d) are not abstractions from something else (see Lewis 1986, § 1.7).

[4] Yes, Quine is quite skeptical about possible worlds. It should be noted, however, that it is the lack of criteria of identity of possibilia that Quine is worried about. When it comes to Lewis, the worry disappears. See Divers (2007).

[5] The reformulation can be found in Naylor (1986), Yagisawa (1988) and Vander Laan (1997).

[6] The view that impossible worlds should inherit the metaphysical status of their possible mates is called Parity Thesis. For further arguments against drawing an ontological division between possible and impossible worlds, see Priest (1997, 580-581) or Priest (2005, 139).

neither possible nor impossible worlds, or we do so in both cases. In the former (reductio) case, we get:

1. If Lewis's argument can be applied in the case of possible worlds, then it can be applied, mutatis mutandis, in the case of impossible worlds as well.
2. Lewis's argument cannot be applied in the case of impossible worlds. Therefore
3. Lewis's argument cannot be applied in the case of possible worlds either.

To support the latter alternative – the one advocated in this paper – is to accept the Lewisian argument from ways and apply it uniformly to the case of impossible worlds. The result is a *modus ponens* version which looks as follows:

1. If Lewis's argument can be applied in the case of possible worlds, then it can be applied, mutatis mutandis, in the case of impossible worlds as well.
2\*. Lewis's argument can be applied in the case of possible worlds. Therefore
3\*. Lewis's argument can be applied in the case of impossible worlds as well.

A quite different reason for the acceptance of impossible worlds is the so-called granularity problem. Famously, Lewis, following Quine, accepts the identity conditions for sets according to which a set A is identical to a set B *iff* for all members x of A it holds that they are also members of B and vice versa. Also, Lewis accepts a so-called Natural Class Theory (Armstrong 1989) according to which a property is ontologically identified with a set of its instances. But then, some problems arise. Namely, if there are cases where two mutually *distinct* properties are *necessarily* coextensive (including properties had by no Lewis's individual whatsoever), Lewis's theory lacks the resources to distinguish them. For example, is the property of, say, 'being a married bachelor' the same as the property of 'being a round square', namely the empty set? In the same manner, is the property of 'being trilateral' the same as the property of 'being triangular'? If we suppose that a) the properties in fact are different, and b) do not include married bachelors, round squares or trilateral but not triangular individuals into

modal realists' ontology, our pre-theoretical opinions about their distinct-ness are violated.[7] Unless we can do better.

## 4. Concreteness abandoned

Famously, Lewis's denial of genuine *impossibilia* – worldbound individuals instantiating *genuine* impossibilities (Divers 2002, 67) – rests on a simple argument, according to which a contradiction in some impossible world would infect the world we are part of. And since there is no (actual) subject matter about which you can tell the truth by contradicting yourself (Lewis 1986, 7, fn. 3), impossible worlds – at least those concrete – do not exist.

However, one could argue that we can keep the Lewisian possibilia and thus save his analyses about possible matters and, at the same time, construct various impossible worlds out of them. Lewis himself notes that he could construct excellent *ersatz* worlds 'drawing on the genuine worlds for raw material':

> ...there is room for different versions of 'ways things might be' or 'pos-sibilities' or 'structures'. If you mean to include ways that something less than an entire world might be, then again you need sets of possible in-dividuals. If part of the role you associate with these terms is a principle of identity of indiscernibles, you had better take not just any sets but only those that include both or neither of any pair of indiscernible indi-viduals. If, on the other hand, you want to confine your attention to maximal 'ways', and you do not require guaranteed identity of indis-cernibles, then you might as well replace unit sets by their sole mem-bers. If you associate with 'state of affairs' a role involving predication, I would recommend individual-property pairs, where the property in turn is taken as a set of possible individuals. And so on. (Lewis 1986, 185-186)

If so, *ersatzists* argue, why do not go one step further and construct *ersatz impossibilia* out of the stock of genuine possibilia? For example, given the (unrestricted) existence of concrete actual and possible individuals, (*ersatz*)

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[7]    Since, for Lewis, propositions are special kinds of properties, the same line of argu-ment applies to the indistinguishability of necessary coextensive propositions considered as sets of whole possible worlds.

impossible worlds could be set-theoretic constructions out of *propositions* or set-theoretic constructions out of *states of affairs*. In any case, the idea that impossible worlds are a free lunch can be seen as serviceable and, given the Lewisian criteria of success, methodologically more appealing than the extension of our ontological commitments.

## 5. Hybrid modal realism

Following Divers's suggestion (Divers 2002, Chap. 5), Franz Berto (2010) presents one possible solution to the problem of *impossibilia*. In particular, Berto points out that in order to avoid the granularity problem, the world semantics should be extended by impossible worlds (Berto 2010, 471-472). Moreover, the extension should not infect the Lewisian ontology, should sustain the non-modal analysis of modality and stay as conservative as possible.

By accepting the Lewisian ontology – concrete possible worlds and set-theoretic constructions out of them – Berto develops such a modal theory according to which a) *de dicto* possibilities are represented by (genuine) possible worlds, while b) those phenomena of (at least logical) impossibility are represented by *ersatz* entities playing the roles of impossible worlds. Since this account avoids the consequence that concrete individuals instantiate genuine impossibilities, Lewis's objection does not apply here. Thus, one can be a genuine realist about possibilia, while a so-called *ersatzist* about their impossible mates.

The basis of Berto's proposal rests on the Lewisian account of propositions which, briefly, says that propositions A and B are the same propositions *iff* A and B are true at the same possible worlds and, that is the case *iff* A and B are the same set of worlds (cf. Berto 2010, 471). Since, according to Lewis, worlds represent *de dicto* possibilities by *instantiating* propositions directly, basic propositions like 'it is raining', 'it is not raining' or 'there are married bachelors' are simply those sets of concrete possible worlds that the propositions 'it is raining', 'it is not raining' and 'there are married bachelors' hold at them, respectively. The question, however, is whether genuine modal realism has resources for constructing *ersatz* impossible worlds without violating its thorough extensional character. To put the problem otherwise: does genuine modal realism contain the resources for constructing *ersatz* impossible worlds qua sets of propositions? Berto thinks that it does.

In particular, if we consider basic atomic propositions to be sets of concrete worlds, and, using the set-theoretic machinery, consider impossible worlds to be sets of proposition, we get a fully extensional account of possible worlds as well as impossible worlds. Since impossible worlds, or world-books,[8] are reducible to sets of propositions, and propositions are identified with sets of worlds, impossible worlds can be simply identified with certain sets of sets of concrete possible worlds.

For instance, let us have two distinct contradictory propositions, 'the sun is shining and the sun is not shining' and 'it is raining and it is not raining'. Let us also suppose that the Lewisian logical space consists of exactly six worlds $\{w_1, w_2, w_3, w_4, w_5, w_6\}$. Provided that the proposition 'it is raining', A, is identified with the set $\{w_1, w_2, w_3\}$ and the proposition 'it is not raining', $\sim$A, with the set $\{w_4, w_5, w_6\}$, the contradictory proposition 'it is raining and it is not raining' – (A and $\sim$A) – is, by the same reasoning, identified with the set of the above sets, namely $\{\{w_1, w_2, w_3\}, \{w_4, w_5, w_6\}\}$.[9] The resultant set is an impossible world, $i_1$, because it represents an inconsistent situation. Now, let us also suppose that the proposition 'the sun is shining', B, is identified with the set $\{w_1, w_3, w_5\}$ and its negation, $\sim$B, with $\{w_2, w_4, w_6\}$. Similarly, the contradictory proposition 'the sun is shining and the sun is not shining' – (B and $\sim$B) – is then the set $\{\{w_1, w_3, w_5\}, \{w_2, w_4, w_6\}\}$. Let call the impossible world $i_2$. No doubt, impossible worlds $i_1$ and $i_2$ are different. While $i_1$ is identified with the set of the form $\{\{w_1, w_2, w_3\}, \{w_4, w_5, w_6\}\}$, the form of $i_2$ is quite different – $\{\{w_1, w_3, w_5\}, \{w_2, w_4, w_6\}\}$.

Next, beside the distinctness of (any two) contradictory propositions, Berto's approach can represent various impossible situations where there are three or more true, but mutually incompatible distinct atomic propositions. To use Berto's own example, the propositions 'Nassau Street runs east-west', 'the Railroad nearby runs north-south' and 'Nassau Street is parallel to the railroad nearby' are mutually incompatible. We can, however, construct such an *ersatz* impossible world which represents the impossibility.

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[8]   The term 'world-book' is from Plantinga (1974, especially Chap. 4).

[9]   Here, Kiourti (2010, 80) quite correctly notes that if the aim was to differentiate between different contradictions true at some *ersatz*-world, we will have to define conjunction and, consequently, all logical connectives recursively. That means, however, that such an approach commits its proponents to a particular logical behavior for the logical connectives at such impossible worlds.

Namely, let us suppose that the proposition 'Nassau Street runs east-west' holds in $w_1$, $w_3$, $w_6$, the proposition 'the Railroad nearby runs north-south' holds in $w_2$, $w_3$, $w_5$ and the proposition 'Nassau Street is parallel to the rail-road nearby' hold just in the world $w_6$. Any world at which all of them hold must be impossible, because there is no Lewis's world in which all of them hold. But that is no problem anymore. We can represent the impossibility, nonetheless: $\{\{w_1, w_3, w_6\}, \{w_2, w_3, w_5\}, \{w_6\}\}$. End of theory (Berto 2010).

A slightly different approach to *ersatz* theory proposes Edwin Mares (Mares 1997). Trying to stay ontologically as neutral as possible, Mares assumes there to be a set of all possible worlds (whatever they are), individuals existing in those worlds, relations, a possibility to collect those individual into a unique set and, finally, sets themselves (Mares 1997, 519).

Then, Mares introduces states of affairs, meaning structures having the following form:

$$\langle R, a_1, ..., a_n, \pi \rangle$$

Here, R is an *n*-place relation, $a_1$, ..., $a_n$ are individuals, and $\pi$, called polarity, is either 1 or 0. The mention of 1 and 0 indicates, that while some of the states of affairs obtain, others do not. However, the story is even more complicated, because unless we want to face the idea of negative states of affairs, we might think of the structure as a piece of information rather than a state of affairs (see Kiourti 2010, 84). In this case, informational sequences can tell us whether some relation *R* does or does not hold between the individuals in the sequence. This, subsequently, allows us to delineate those negative states of affairs that fail to obtain from those whose negations obtain instead, and thus fulfill Mares's desideratum that negative information does not reduce to the absence of positive information (Mares 1997, 520). Thus, the information that it is not raining in Auckland does not reduce to not having the information that it is raining in Auckland.

The next step in Mares's strategy is the introduction of an index. According to him, an index is a (maximal) set of states of affairs such that for any n-place relation R and any sequence of individuals $a_1$, ..., $a_n$, either $\langle R, a_1, ..., a_n, 1 \rangle$ is in the index, $\langle R, a_1, ..., a_n, 0 \rangle$ is in the index or both states of affairs are in the index. The indices represent worlds. Although not any index represents a possible world, any index represents some world. For, for all states of affairs

(M)    $\langle R, a_1, ..., a_n, 1 \rangle$ and $\langle R, a_1, ..., a_n, 0 \rangle$
       $\langle R, a_1, ..., a_n, 1 \rangle \in i$ *iff* $\langle a_1, ..., a_n \rangle$ is in the extension of R at w
       and
       $\langle R, a_1, ..., a_n, 0 \rangle \in i$ *iff* $\langle a_1, ..., a_n \rangle$ is not in the extension of R at w.

Now, how can the theory help the Lewisian to accommodate impossible worlds? Naturally, the easiest way is to consider Mares's individuals as genuine full-blooded individuals and relations (including properties) as sets of ordered individual pairs (or just sets of individuals in the case of properties). Polarity could be understood as an inclusion of the individual(s) at issue in the sets. For instance, an outright contradiction 'it is raining and it is not raining' can be easily represented by an index $\langle \langle R, a, 1 \rangle, \langle R, a, 0 \rangle \rangle$, where a stands for a world and R stands for the set of worlds such that it is raining at them. While the former sequence of the index is positive, thus representing the case of raining in a, the latter is apparently its negation. Consequently, we get an index representing logical contradiction and, a fortiori, an impossible world, without going beyond the Lewisian ontology.

Similarly, the contradictory proposition 'the sun is shining and the sun is not shining' can be represented by an index $\langle \langle S, a, 1 \rangle, \langle S, a, 0 \rangle \rangle$, where, as in the previous case, a stands for a particular world, S stands for the property of shining and 1 and 0 for the inclusion and exclusion of the respective world in the respective set-theoretic construction. Since the indices $\langle \langle R, a, 1 \rangle, \langle R, a, 0 \rangle \rangle$ and $\langle \langle S, a, 1 \rangle, \langle S, a, 0 \rangle \rangle$ are obviously distinct,[10] the apparatus is strong enough to differentiate between various purely logical impossibilities. That is Mares's theory in a nutshell (cf. Mares 1997).

## 6. Evaluating hybrid modal realism

In sum, it is undeniable that both of the above proposals present a strong improvement of genuine modal realism. As it seems, they are more conservative than the original theory, because they can a) account for more of our pre-theoretical opinions than the original theory and, at the same time, b) do not extend the Lewisian ontology. All the work is done by the movements in the definitions, namely the definition of impossible world.

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[10]    Apparently, the distinctness rests on the fact that *S* and *R* are distinct sets of worlds. While *S* denotes the set of worlds being such that the sun is shining at them, *R* denotes the set of 'rainy' worlds.

Also, the proposals have certain theoretical as well as methodological virtues. Firstly, the reduction of impossible worlds to the Lewisian individuals and sets is fully extensional. At the base level, we have individuals, sets, and set-theoretic constructions out of them. Then, impossible worlds – being certain set-theoretic constructions – are a free lunch, 'lying around the house of almost any possible world theorist' (Mares 1997, 525). Secondly, given the fundamental difference between possible and impossible worlds and, a fortiori, a non-modal distinction between them, we can sustain the very definition of possibility without any resort to primitive modality. Namely, the Lewisian dictum

(P)     It is possible that P *iff* there is a world, w, such that at w, P

still holds, while the quantifier in the right-hand side ranges only over the maximal mereological sums of spatiotemporally interrelated individuals. On the other side, the impossibility claims get different interpretation. Instead of the Lewisian account of impossibility

(I)     It is impossible that P *iff* there is no possible world, i, such that at i, P,

we have the *ersatzist* version, namely

(I*)    It is impossible that P *iff* there is a world, i, such that at i, P

while the domain of the right hand side quantifier comprises sets of sets of concrete possible worlds only.

Finally, and most importantly, allowing there to be *ersatz* impossible worlds constructed out of concrete individuals avoids Lewis's lethal objection that contradiction obtaining at those worlds amounts to a plain contradiction in the actual world. Recall that Berto's and Mares's impossible worlds *are* books – either some sets of propositions or some sets of informational sequences – and so although it still holds that the phrase 'at (concrete world) w' in (P) works as a modifier restricting the (explicit or implicit) quantification to particular domains, the phrase 'at i' in (I*) works quite differently. For, Berto's as well as Mares's *ersatz impossibilia* are abstract set-theoretic entities in the case of which the phrase 'according to some *ersatz* impossible world' is not a restricting modifier. For that reason, there is an impossible world *according to which* a contradiction is true without the contradiction infecting the actual world. And those are very good results.

## 7. Ad hoc ontological distinction?

As indicated above, some virtues of the proposals above are remarkable and that is the reason why we should take them seriously. Berto, as well as Mares, are successful in their analyses of modality in non-modal terms. They also score in distinguishing (at least some) apparently (not only logically impossible) propositions, without any extension of the Lewisian ontology. Moreover, they do not (radically) contract the Opinion and thus preserve conservativeness without any violation of economy.

It was argued by several philosophers, however, that the fundamental difference between possible and impossible worlds is not justified. According to Lewis, the actual world is not an abstract entity. So why other worlds should be? By the parity of reasoning, possible worlds are not abstract entities so why impossible worlds should be? The possible objection to the above proposals, therefore, is whether any approach deeming possible worlds as concrete universes, while deeming impossible worlds to be mere *ersatz* constructions, does not pose an ad hoc and, a fortiori, unjustified distinction.

In a similar vein, Graham Priest writes:

> ... there is, as far as I can see, absolutely no cogent (in particular, non-question begging) reason to suppose that there is an ontological difference between merely possible worlds and impossible worlds – any more than there is for supposing there to be such a difference between merely possible worlds which are physically possible and those which are physically impossible. To differentiate between some non-actual worlds and others would seem entirely arbitrary. (Priest 1997, 582)

As the passage concludes, to make a fundamental distinction between possible and impossible worlds does not seem to be justified without begging the question. Also, David Vander Laan (1997) argues that such a slight difference in our language as the difference between 'the way the world could be' and 'the way the world could *not* be' should not justify such a radical difference between possible and impossible worlds. He asks:

> Is there a principle of ontology which would justify our construing these similar parts of our modal language in such dissimilar ways? (Vander Laan 1997, 600)

However, any attempt to weaken the hybrid theories just by raising the objection from an ad hoc difference must fail. Granted, it may seem arbi-

trary or unjustified to start with the presumption that possible worlds and impossible worlds are quite different kinds of things. But if the best overall theory plays out that way – that is, if conservativeness-cum-economy is maximised by identifying possible worlds with one kind of construct and impossible worlds with another – the putative intuition for or against the parity has nothing to do with it.

Thus, it seems that Vander Laan is plainly wrong when saying that there is not such a principle of ontology that would justify our construing these similar parts of our modal language in such dissimilar ways. Of course, there is such a principle: the parity or imparity thesis is justified if that is how the best analysis plays out. Put otherwise, it is not an input of any analysis whether the parity thesis is justified or not. On the contrary. There is nothing wrong in saying that impossible worlds are ontologically distinct from possibilia, given that the theory posing the distinction does not lead to trouble while the theory that poses the parity does. What we as philosophers are looking for is the ideal 'definitions + ontology and ideology' package combining a) the best balance of conservativeness and economy b) the preservation of all (or almost all) of our pre-theoretical opinions and c) the sufficient advantages to its rivals. An opinion whether the parity thesis holds or not plays no role at all.

I, therefore, conclude that the objection to hybrid versions of modal realism that rests on a putative illegitimacy of the ontological distinction between possible and impossible worlds is not a good way to dismiss the proposals. Since it is the objection itself, not what is objected, that is unjustified by the Lewisian well-defined conception of analysis, it does not present serious troubles for the above approaches. Since it is an input, rather than an output of the analysis how the nature is carved along the joints, there is simply no non-question-begging reason to think that possible and impossible worlds are of the same metaphysical kind. It is fully in the competence of the total theory to decide.[11]

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[11]   A quite different objection would be to say that some contradictory worlds are abstract, even if we think that they are possible. Then, the ontological distinction between various possible worlds would be, of course, illegitimate.

## 8. Why still bother with concrete impossibilia?

Given the proposals above, one would think that some hybrid theory of genuine modal realism is the most reasonable way to go. Since both proposals have sources to represent outright contradictions, they can distinguish between various contradictory propositions, provide non-trivial interpretations of counterpossible conditional, differentiate between impossible propositional states and so forth. Also, at first sight, the proposals at issue have certain similar features. As Berto distinguishes between contradictory propositions of the form (A and ~A) and (B and ~B) by constructing impossible worlds out of some sets of possible worlds, Mares constructs his impossible worlds out of sets of possible worlds, sets of individuals and the polarity.

But why does Mares need those structured states of affairs instead of mere sets of worlds? The answer is clear: there are not only outright contradictions among the impossibilities that we intuitively distinguish. There is much more. What about such impossibilities as 'there are married bachelors' or 'some triangular individuals are not trilateral', etc.? Those impossibilities are not purely logical impossibilities, since they are not of the form (A and ~A).

Granted, Berto's theory gives us various representations of different impossibilities by using genuine worlds. However, there are several limits the hybrid theory has. Recall, that one of the motivations for *impossibilia* was the need to differentiate between various necessary coextensive and impossible propositions, and thus provide a finer-grained distinction absent in the original theory. For, according to Lewis, the property of 'being trilateral' is identified with the property of 'being triangular', because any (actual and possible) individual which is trilateral is also triangular, and vice versa. But the problem seems to preserve even in these theories.

To see the problem, let us have two (distinct) propositions, 'Toby is triangular' and 'Toby is trilateral'. Apparently, the aim is to show that the propositions are different, and thus that the proposition 'Toby is triangular but not trilateral' can be represented by an (*ersatz*) impossible world distinct from a world according to which 'Toby is triangular but not triangular'. Provided Berto's strategy, and given a simple logical space consisting of three worlds – $w_1$, $w_2$, $w_3$ – we can identify the proposition 'Toby is trilateral' with, say, the set of worlds $\{w_1, w_2\}$ and its negation with $\{w_3\}$. Given the Lewisian pluriverse, the same holds for the proposition 'Toby is trian-

gular', namely that the proposition is identified with the set $\{w_1, w_2\}$,[12] while its negation with $\{w_3\}$. But then the impossible proposition 'Toby is triangular but not trilateral' – $\{\{w_1, w_2\}\}, \{w_3\}\}$ – is not different from the impossibility 'Toby is triangular but not triangular' $\{\{w_1, w_2\}\}, \{w_3\}\}$. But we wanted to say that!

Also, our initial motivation to differentiate between various propositions holding at no (possible) world is not fulfilled here. For instance, the propositions 'there is a married bachelor' or 'there is a non-identical individual' are still conflated in Berto's account. Since there are neither worlds such that there are married bachelors in them, nor worlds such that non-identical individuals exist in them, we simply lack the 'raw material' to delineate the distinction.

Berto, being aware of the problems, admits that everything goes fine when we want to represent impossibilities which are adequately phrased as explicit contradictions (Berto 2010, 484). For, such impossibilities are of the conjunctive form (A and ~A), resp. (B and ~B). The problems arise when it comes to representing distinct (non-conjunctive) impossibilities. That means that although Berto's proposal does differentiate between various distinct impossible propositions, namely those which are the results of conjoining two (basic) propositions that are not true together in any Lewis's world, it does not allow us to differentiate between impossibilities being not of the conjunctive nature.

Mares's approach, on the other side, is not limited in this way. Since the main point of the proposal is that it allows us to attribute properties and relations to individuals that do not have them in any Lewis's world (Kiourti 2010, 85), it can accommodate several subtler impossibilities. Not only every outright contradiction of the type (A and ~A), but also impossibilities like 'something is blue and yellow all over' are analyzable in the theory. For example, an impossibility of there being something, say car, that is blue and green all over is represented by a world of the following form: $\langle\langle B, a, 1\rangle, \langle Y, a, 1\rangle, \langle C, a, 1\rangle\rangle$. Here, a stands for an individual, B stands for the property of 'being blue', Y for the property of 'being yellow' and C for the property of 'being a car'. It is because of the fact that the set of all (unrestrictedly speaking) blue things is different from the set of all (unrestrictedly speaking) yellow things as well as from the set of all (unrestrictedly

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[12]   It is because of the fact that there is no Lewis's world, w, such that something is triangular but not trilateral in w.

speaking) cars. Similarly, to use Berto's own example, the impossibility of there being negatively and positively charged particle and a quite different impossibility of there being positively and not positively charged particle can be distinguished, since the former world – ⟨⟨E, a, 1⟩, ⟨P, a, 1⟩, ⟨N, a, 1⟩⟩ – differs from the latter: ⟨⟨E, a, 1⟩, ⟨P, a, 1⟩, ⟨P, a, 0⟩⟩. Here, E stands for the property of 'being an electron', P and N correspond to the properties of 'being positively charged' and 'being negatively charged', respectively.

So far so good. However, even this approach has certain limitations. For example, it cannot deal with some necessarily coextensive properties and propositions. For example, let have the property of 'being trilateral' and the property of 'being triangular'. If we identify the properties with their instances we, unfortunately, do not get two *distinct* sets, namely the set of all trilateral individuals and the set of all triangular genuine individuals. Since there is no world in the Lewisian pluriverse that contains a trilateral but non-triangular individual, the sequences ⟨A, a, 1⟩ and ⟨S, a, 1⟩, where S stands for the property of 'being trilateral' and A stands for the property of being 'triangular' will be identified with the same sequence. Simply, if A and S denote the same set, the indices ⟨⟨A, a, 1⟩, ⟨S, a, 0⟩⟩ and ⟨⟨A, a, 1⟩, ⟨A, a, 0⟩⟩ represent the same (impossible) world. But the impossibilities 'Toby is triangular but not trilateral' and 'Toby is triangular and not triangular' are not the same.

Moreover, even this proposal does not express the intuitive difference between various (distinct) impossible properties. Recall, that what any theorist preferring this proposal has at disposal is the Lewisian ontological base. As we already know, it includes (only logically consistent) individuals and set theoretic constructions out of them, none of which is non-self-identical or contradictory. Yet, all of them are self-identical and non-contradictory. But if we want to express the difference between the properties, we have to take the set of non-self-identical individual and the set of contradictory individuals as the constituents of the sequences. Consequently, we get the sequences ⟨N, a, 0⟩ and ⟨C, a, 0⟩, respectively. Given that the letters N and C stand for the same set – the set of all non-self-identical individuals and the set of all contradictory individuals, respectively – the sequences are identical.

On the other hand, every individual in the Lewisian ontology is consistent as well as every individual is such that it is identical to itself. Both of the properties are thus identified with the same set of individuals – the whole plurality of possible individuals. Thus, if I stands for the property of

being 'identical to itself' and C for the property of 'being a consistent individual', the sequences ⟨I, a, 1⟩ and ⟨C, a, 1⟩ are identical, since the letters I and C denote the same set. Then, the propositions 'something is self-identical but not consistent – ⟨⟨I, a, 1⟩ ⟨C, a, 0⟩⟩ – and 'something is self-identical and not-self-identical – ⟨⟨I, a, 1⟩ ⟨I, a, 0⟩⟩ – are, due to the identity between I and C, the same. The intuitive difference is lost.

The reason, as far as I can see, is that neither Berto's, nor Mares's proposal admits there to be genuine *impossibilia* at the ontological base. Then, it is just to be expected that certain kinds of properties – especially those instantiated by every or no individual in the ontological base – will have to be identified. Thus, although the raw material used in the constructions is extensive enough for a variety of distinctions, the fact that it does not contain full-blooded *impossibilia* does bring certain limitations (see Kiourti 2010, 82).

Therefore, whether the project of construction of *ersatz* impossible worlds out of concrete possibilia is successful is one thing. How we get into it is quite another. To look at the problem from the Lewisian well-defined conception of analysis, it is very easy to trace the (rather similar) strategies. Berto and Mares stress the fact that we pre-theoretically presuppose the difference between impossible phenomena and thus our theory should reflect it. They also accept and (definitely do not extend) the ontology and so propose to modify the definition of impossibility. And that is a huge virtue of the proposals. On the other side, we are still left with a variety of unresolved problems, namely the inability to differentiate among certain impossible properties, the inability to differentiate among certain necessary properties or even necessarily coextensive properties. Thus, as usual, the question is whether the advantages of the above proposals overweigh their costs on one side, preserve the Lewisian crucial features, on the other.

Next, it would seem that the existence of genuine (concrete) *impossibilia* – instead of mere *ersatz* constructions out of possibilia – seems to be such as to provide a more unified, simpler and more systematic treatment of modal matters (see Yagisawa 1988). Surely, the hypothesis of the extended modal realism is just the beginning. It can turn out that the extension of the Lewisian ontology by genuine *impossibilia* would harm the theory to such an extent that no other moves in the pre-theoretical opinions, the definitions or the ontology would 'cure' the consequences. Yet, it is still worth of considering how the proposal to extend Lewis's ontology by concrete impossibilia squares with the overall theory.

For modal realist, a certain sentence is true at a world *iff* it is true when we quantify over all the things in that world. By the same token, when Lewis advocates the existence of mere possibilia, he strictly differentiates between actual truths and truths *simpliciter*. For example, the claim

(1)    There is no beer

can be true, when quantifying over the empty fridge, although false when quantifying over, say, the whole country. Similarly, the claim

(2)    There are flying pigs

is false provided that we take the actual world into the account. Hence:

(3)    Flying pigs do not *actually* exist

is true. That does not, however, mean that the flying pigs do not exist *simpliciter*. Of course, sometimes it is reasonable to ignore them and quantify over us and our surroundings only. But to ignore something does not imply that the entity at issue does not exist.[13] In other words, Lewis denies (A):

(A)    *Actually* P *iff* (unrestrictedly) P,

where P stands for a proposition such as, say, 'there are flying pigs'. Since there are no flying pigs in the actual world, the left-hand side of the biconditional is false. But, as concretist's ontology dictates (Lewis 1986, § 1.1), individuals of this kind *do* exist, none the less.

Interestingly enough, Lewis's strategy changes when it comes to impossibilities. In comments on Lycan, he states: "He [Lycan] is not suggesting that I claim to quantify over incomplete or inconsistent Meinongian objects – of course I do not – but only that I claim to quantify beyond actuality" (Lewis 1986, 98). Therefore:

(N)    *Necessarily* P *iff* (unrestrictedly) P[14]

is, for Lewis, true. For instance, it is a truly remarkable fact that the Law of Non-Contradiction is true *simpliciter* because it holds with respect to any *possible* world. Analogously, the Law of Non-Contradiction is true necessar-

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13    That is, I think, the moral Lewis's modal realism implies.

14    For a similar strategy, see Kiourti (2009, Chap. 4).

ily, because there is no *possible* world which would violate the principle. As a result:

> (4)    *Necessarily* the Law of Non-Contradiction holds *iff* the Law of Non-Contradiction holds *simpliciter*

is true in traditional Lewisianism.

But, as we have already learned,[15] impossibilia may be objects of beliefs, counterfactuals with impossible antecedents are not all trivially true, there are different impossible properties and propositions etc. Thus, it seems as (4) is false. Since there are (excellent) reasons for proceeding to wide quantification so as to include possibilia *as well as impossibilia* within the scope of logic (Routley 1980, 83), to widen the scope of quantification beyond possibilia seems nothing but a regimentation of our pre-theoretical modal talk.[16] Consequently

> (5)    *Necessarily* the Law of Non-Contradiction holds *iff* the Law of Non-Contradiction holds when quantifying over possibilia

is true, while

> (6)    *Necessarily* the Law of Non-Contradiction holds *iff* the Law of Non-Contradiction holds when quantifying over possibilia *and impossibilia*

is false.

To conclude, we have seen that Lewis's possibilitist's strategy rests on the difference between two kinds of truths, namely *actual* truths and truths *simpliciter*. However, Lewis ignores the analogous difference, i.e. the difference between *necessary* truths and truths *simpliciter*. But, by noting the very similarity between the principles (A) and (N), Lewis's commitment to the latter principle seems question-begging.[17] More accurately: Why do not stretch an extra mile and provide a similar argument for the existence of impossibilia as we did in the case of mere possibilia? Surely, the violation of the Law of Non-Contradiction is a tricky move in any theory. But in order

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[15]   To mention just few prima facie contributions to the debate, see Yagisawa (1988), Priest (1997), Berto (2008; 2010), Kalhat (2008) or Kiourti (2009).

[16]   How such logic could look like, see Routley (1980), Kiourti (2009) or Berto (2010).

[17]   That Lewis begs the question when it comes to impossibilia, see also Kalhat (2008).

to deal with inconsistency (and indeterminacy) logically, what else could we expect. Once we change (or rather liberalize) semantics to the extent that it accommodates possible and impossible individuals without failing into an utter nonsense, the impossible phenomena can be treated on a logical basis.

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