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Primitive Worlds

Modal Dimensionalism is a metaphysical theory about possible worlds that is naturally suggested by the often-noted parallelism between modal logic and tense logic. It says that the universe spreads out not only in spatiotemporal dimensions but also in a modal dimension. It regards worlds as nothing more or less than indices in the modal dimension in the way analogous to the way in which Temporal Dimensionalism regards temporal points and intervals as indices in the temporal dimension. Despite its naturalness and intuitive appeal, Modal Dimensionalism has been largely ignored while the debates between David Lewis and his critics have dominated the discourse on the nature of possible worlds. It is high time that we took Modal Dimensionalism seriously as a viable alternative.

0. Introduction

The classical modal semantics analyzes alethic modal notions in terms of possible worlds. It analyzes possibility in terms of existential quantification over possible worlds. This and related uses of possible worlds have proven amply fruitful. The metaphysical question on the nature of possible worlds is therefore of considerable philosophical importance. A number of different answers have been proposed to the question, " What are possible worlds?" I shall consider two leading answers, find them inadequate, and propose a different answer. I do not know whether the answer I shall propose has been explicitly endorsed before but a version of it has been explicitly rejected at least twice.

The first view I shall consider is a familiar one. Among the competing theories of possible worlds, it has commanded the highest number of philosophers who have endorsed it explicitly or implicitly. The core idea of this view is to define a possible world as a maximal consistent something or other. The "something or other" may

be a state of affairs, a situation, a proposition, a set of states of affairs, a set of propositions, a set of sentences, or some other such thing. Some representative theories of this type include (Carnap, 1947), (Cresswell, 1972), (Plantinga, 1974), and (Adams, 1974). Following David Lewis, I shall group together all these characterizations of a possible world under the label *Ersatzism*. Lewis coined this term because he thought these characterizations of a possible world merely offered unacceptable replacements for the real thing. I agree with Lewis's sentiment and happily adopt the term. Of course, Lewis thought he himself had a definition of a possible world that delivered the real thing. Although I think he came closer to the real thing than the Ersatzers, I do not believe he quite succeeded, either. I shall call his view *Lewisianism*. Lewisianism defines a possible world as a maximal mereological sum of spatiotemporally related things. This characterization of Lewis's definition of a possible world is only a rough approximation but is adequate for our purposes, for the more subtle version Lewis favors would add little to our discussion. See (Lewis, 1986: 74-78). In the last three decades or so, debates between the Ersatzers and the Lewisians have dominated the modal metaphysical discourse.

I do not mean to suggest that no other views on the nature of possible worlds have been discussed. Especially worth mentioning among those views which are neither Lewisian nor Ersatzist is, of course, Saul Kripke's discussion in (Kripke, 1980). There is no denying that Kripke's "stipulativist" view of possible worlds has been influential. At the same time, Kripke's view has remained sketchy and suggestive at best and in particular, he has not offered any metaphysically serious definition of a possible world. Another view which deserves to be mentioned is Robert Stalnaker's definition of a possible world as a way the actual world could have been. Stalnaker's view falls somewhere between Ersatzism and Lewisianism: see (Stalnaker, 1976). I agree with some parts of what he says and disagree with others. I shall not discuss Stalnaker's or anyone else's proposal, such as Forrest's in (Forrest, 1986) or Zalta's in (Zalta, 1987) for example, for the reason of dialectical compactness. Remember that my aim is to motivate and launch a new view, not to mount a full defense of it. With that in mind, I shall provide brief critical reviews of some widely noticed main difficulties of Ersatzism and Lewisianism before making a positive proposal.

I.   Ersatzism

Since there are a number of different versions of Ersatzism, we had better pick a particular version for definiteness of discussion. Let us arbitrarily choose the one (proposed by Adams) which says that a possible world is a maximal consistent set of propositions. We shall proceed in such a way that whenever our discussion hinges on an idiosyncratic feature of this version of Ersatzism not shared by the other versions, it is possible to recast the discussion to accommodate the other versions. Ersatzism is unsatisfactory. I shall review four important reasons why.

The first problem with Ersatzism is that it is circular. According to Ersatzism, possibility is true existential quantification over possible worlds, and a possible world is a maximal consistent set of propositions. For a set of propositions to be consistent is for it not to entail a contradiction. For a set of propositions not to entail something is for it to be possible for the propositions in the set to be all true and that something false. So, possibility is explicated ultimately in terms of possibility, which is circular. Most Ersatzers admit this one way or another and say something to the effect that their position should be understood as offering nothing more than methodologically useful conceptual heuristics. This weakens Ersatzism considerably as a serious metaphysical position.

The second problem with Ersatzism is that it makes the actual world non-existent. According to Ersatzism, the actual world is the maximal consistent set of true propositions. Call that set S. It is easy to see, as Patrick Grim has shown by using an ingenious neo-Cantorian argument, that S is a paradoxical set. Suppose S exists. Let a be a member of S. For any subset X of S, there is a true proposition concerning a's membership in X, viz., either the proposition that a is in X or the proposition that a is not in X. There is one such distinct proposition for each subset of S. Every such proposition, since it is true, is a member of S. So, there are as many members of S as there are subsets of S. But there are more subsets of S than there are members of S (Cantor's power set theorem). Hence, there are more members of S than there are members of S; a contradiction. Therefore S, the actual world, does not exist. See (Grim, 1991: 91-98) for details. A theory of possible worlds without the actual world is a non-starter.

(It is a disturbingly widespread misconception to think that Ersatzism agrees with Lewisianism in holding that the actual world is the concrete totality of which all of us are mereological parts. An Ersatzer need not deny the existence of such a totality but certainly does not identify the actual world with it. According to Er-

satzism, every possible world is a maximal consistent set of propositions. The actual world is a possible world. Thus the actual world is a maximal consistent set of propositions. The only distinguishing mark that separates the actual world from merely possible worlds is that all members of the actual world are true and all true propositions are members of the actual world.)

The third problem with Ersatzism is that it cannot provide enough possible worlds to account for some exotic possibilities. It is an important part of Ersatzism that all possible worlds are to be (abstract) parts of the universe as it actually is,. (Hence there is a very close connection between Ersatzism and the metaphysical position generally known as Actualism.) So, all propositions that are supposed to constitute possible worlds are to be constructed out of the resources of the universe as it actually is. This means that a pair of possibilities differing from each other only with respect to properties totally alien to the universe as it actually is are not distinguished. Consider, for example, two possible worlds which are indistinguishable from each other except for two physically basic properties both of which are totally alien to the universe as it actually is, and one world instantiates one of the properties wherever the other world instantiates the other property. Ersatzism is unable to distinguish between such worlds. For detailed expositions of this objection to Ersatzism, see (Lycan, 1979: 305-12) and (Lewis, 1986: 159-65).

The fourth problem with Ersatzism is that it forces unintuitive truth conditions on modal sentences. Intuitively, the sentence 'Donkeys talk' is directly about donkeys — not any particular donkeys but donkeys in general. The truth condition of this sentence reflects that; the sentence is true just if donkeys talk. Equally intuitively, the sentence 'Possibly donkeys talk' is also directly about donkeys. So intuitively, the truth condition of 'Possibly donkeys talk' should directly involve donkeys. All possible-worlds theorists agree that 'Possibly donkeys talk' is true just if 'Donkeys talk' is true at some possible world. They disagree about how to cash the right-hand side of this biconditional. On Ersatzism, the right-hand side is true just if the proposition that donkeys talk is a member of some maximal consistent set of propositions. So 'Possibly donkeys talk' is true just if a certain particular proposition belongs to some maximal consistent set of propositions. So the truth condition of 'Possibly donkeys talk' directly involves a certain proposition but does not directly involve donkeys.

Some might object that 'Possibly donkeys talk' is a sentence of modality *de dicto*, not *de re*, and therefore its truth condition should directly involve a proposition, not donkeys. This objection is confused. To say that 'Possibly donkeys talk'

is *de dicto* is to say that what is said to be possible is donkeys' talking, whereas to say that 'These donkeys possibly talk' (where the phrase 'these donkeys' refer to particular donkeys) is *de re* is to say that what is said to be possible is these particular donkeys' talking. In either case, donkeys are directly involved in the truth condition. The only difference is whether it is donkeys in general or some particular donkeys that are directly involved. Keep in mind that 'Possibly donkeys talk' is not the same in content as 'Possibly the proposition that donkeys talk is true'. The first is directly about donkeys in general, whereas the second is directly about a particular proposition.

For these (and other) widely known reasons, Ersatzism is unacceptable as a metaphysical theory on the nature of possible worlds. We have three options at this point: (i) revise Ersatzism so as to free it from the above (and other) difficulties, (ii) search for a satisfactory alternative to Ersatzism, (iii) abandon all hope of finding a satisfactory metaphysical theory of possible worlds. I find the first option hopeless and the third option premature.

II.   Lewisianism

Lewisianism is a genuine alternative to Ersatzism. According to Lewisianism, a possible world is a maximal mereological sum of spatiotemporally related things. No part of this definition presupposes the notion of possibility. Lewisianism is therefore non-circular.[1] The actual world is the maximal mereological sum of things spatiotemporally related to us here now, or *the maximal sum related to us* for short. The "us here now" makes the mereological sum actual rather than merely possible. This is Lewis's well-known indexical theory of actuality. The Lewisian actual world, a concrete whole, is obviously not subject to Grim's neo-Cantorian argument. Lewisianism is a Possibilist theory and is therefore not committed to any form of Actualism, thus avoiding the third problem of Ersatzism that it cannot handle alien possibilities. The Lewisian truth condition for 'Possibly donkeys talk' is that donkeys talk in some maximal mereological sum of spatiotemporally related things. It directly involves donkeys. Thus, Lewisianism is free from all of the four problems of Ersatzism we reviewed.

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[1] Or at least so it is intended. For the objection that Lewisianism is circular as it relies on the substantive presupposition that every maxiaml sum of spatiotemporally connected things does not engender any incoherence, see (Shalkowski, 1994). Most Ersatzers, by contrast, do not even pretend to avoid relying on a modal notion in defining a possible world.

This is not to say, of course, that Lewisianism is free from difficulties. As is widely known, a number of objections have been raised against Lewisianism, ranging from the infamous and inarticulate "incredulous stare" to the technical objection that the totality of Lewisian possible worlds is mathematically paradoxical. Lewis has responded to most of these objections, but some of his responses are more successful than others. There are two problems in particular of which Lewis's solutions are less than convincing.

The first problem for Lewisianism is somewhat complementary to the second problem faced by Ersatzism about the non-existence of the actual world. It is that Lewisianism invites skepticism concerning merely possible worlds. The skeptic would say that everything (concrete) is part of the maximal sum related to us, so that non-actual possible worlds in Lewis's sense are nothing. In response to this, Lewis denies that everything (concrete) is part of the maximal sum related to us, and insist that many things fail to be part of the maximal sum related to us. The skeptic would retort that if there are any such things, they will be parts of the universe as it actually is, albeit spatiotemporally disconnected parts, and not alternatives to actuality, hence they will be irrelevant to non-actual possibilities. Thus, the skeptic's point can be put as a dilemma: either everything (concrete) is part of the maximal sum related to us, or something (concrete) is not part of such a sum; if everything (concrete) is part of such a sum, then non-actual possible worlds in Lewis's sense are nothing; if something (concrete) is not part of such a sum, then any such something is part of the universe as it actually is, hence irrelevant to non-actual possibilities. Let us call this objection *Actualist Skepticism*. There is a distinct but closely related objection, which might also deserve the label of Actualist Skepticism. It says that since Lewisianism postulates merely possible worlds as mereological sums of merely possible objects outside the universe as it actually is, it is committed to a separate mode of being other than existence. Such a mode of being is suspect. So, Lewisianism is suspect. Whether one understands Actualist Skepticism in the first way or in the second way, it seems to plague the heart of Lewisianism.

Lewis is well aware of this and offers a little more in response: Non-actual possible worlds exist and they are spatiotemporally disconnected from the actual world; that is, they are not part of the actual world and yet they genuinely exist; here, the word 'exist' is used with the intended domain larger than the actual world — call the larger domain *logical space*; the actual world is but one among countless worlds in logical space. This Lewisian response crucially relies on the domain-

shiftiness of the existence predicates. It is this that allows Lewis to avoid postulating a separate mode of being for merely possible objects and their worlds, distinct from the mode of being for mundane things in the actual world. We do not change the meaning of 'there is' when we say "There is no water" while looking at the empty pitcher on the dinner table and then say "There is too much water" while looking at the overflowing sink in the kitchen. The meaning of 'there is' remains constant while the relevant domain of discourse conveniently shifts from the content of the pitcher to the content of the sink. Water in the pitcher, if there were any, would *be* in the same sense in which the water in the sink *is*. Likewise, non-actual possible worlds exist, according to Lewis, in the same sense in which the actual world and mundane things in it exist. We simply need to have a larger domain of discourse, i.e., logical space, in mind to assert the existence of non-actual worlds truthfully.

The shiftiness of the domain of discourse seems perfectly harmless. Is this a satisfactory response to Actualist Skepticism then? I think not. The skeptic starts from the position that the universe we inhabit provides the absolutely largest domain of discourse. The existence predicates, such as 'exists' and 'there is', cannot range over a larger domain, since none is available. If the universe is the maximal sum related to us, any assertion of the existence of anything not part of the sum is bound to be false, no matter how large the domain may be. If so, an assertion of existence of a Lewisian non-actual possible world is bound to be false. If, on the other hand, the universe includes, in addition to the maximal sum related to us, other maximal mereological sums of spatiotemporally related things, then it is wrong to call them non-actual possible worlds and analyze modal operators as quantifiers over them, for these sums will be simply hitherto unnoticed parts of the universe as it actually is. So the skeptic would insist. At this point, the Lewisian and the skeptic might well accuse each other of begging the question. Thus, Lewis has not provided a satisfactory solution to the problem of Actualist Skepticism but reduced the problem to a stalemate at best.

I have spoken sometimes of *the universe* and sometimes of *the universe as it actually is*. What is the difference? As far as Actualist Skepticism is concerned, there is no difference. The reason is simple. According to Actualist Skepticism, the universe provides the absolutely largest domain of discourse. The universe as it actually is simply the universe. The universe as it could be, that is, the universe as it "non-actually is", is nothing but is represented by many Ersatzist non-actual possible worlds. Those Ersatzist possible worlds are (abstract) objects existing in the universe, that is, they exist in the universe as it actually is.

The second problem for Lewisianism concerns modality *de re* and the counterpart theory. The doctrine of world-bound individuals forces Lewisianism to adopt some version of counterpart theory. 'Gore could have won the U. S. presidential election in 2000' is true just if at some possible world Gore won the U. S. presidential election in 2000. To make sense of the right-hand side of this biconditional in view of the fact that Gore exists only in one world and he lost the election in that world, Lewisianism postulates his counterparts in other worlds; for Gore to win at some possible world is for Gore's counterpart in that world to win. The problem is that there is no satisfactory way to systematize such truth conditions for modality *de re* in general. There is no version of counterpart theory that avoids some absurd modal consequence, such as "Everything actual necessarily exists" or "Something actual could fail to be self-identical" or loss of the ordinary duality of necessity and possibility. See (Lewis, 1983: 31-32) and (Lewis, 1986: 10-12) for details. Lewis's reaction to this problem is to refuse to connect the counterpart theory to modality. He simply declares that we do not need modal discourse as such. He recommends that we speak directly in terms of counterparts in Lewisian worlds. See (Lewis, 1986: 12-13). I find this reaction unattractively cavalier, for it reduces the theoretical utility of Lewisianism; it prevents Lewisianism from providing an analysis of modality *de re*.

III.   Modal Dimensionalism

If, as the Actualist Skeptic insists, the universe is absolutely the largest domain of discourse, then, as long as we are committed to explicating modality in terms of possible worlds, identification of possible worlds with some kind of abstract objects existing in the universe appears unavoidable. If, on the other hand, we wish to explicate modal discourse in a seriously realist spirit, postulation of alternative universes appears unavoidable. I believe, however, that there is a radical third alternative. It is a fully realist theory, yet it does not postulate alternative universes. It does not identity possible worlds with abstract objects or any representations of ways the universe could have been, yet it holds that the universe is absolutely the largest domain. It is the view I call *Modal Dimensionalism.*

The universe has spatiotemporal dimensions. According to Modal Dimensionalism, it also has a modal dimension. Unlike the spatiotemporal dimensions, the modal dimension is not a physical dimension. It is, well, an *alethic modal* dimension — a kind of *meta*physical dimension, we may say. The spatiotemporal dimen-

sions contain spatiotemporal indices, i.e., spatial and temporal locations, which are points and regions of space and time. The modal dimension likewise contains modal indices. Modal Dimensionalism identifies possible worlds with such modal indices. (This does not mean that Modal Dimensionalism defines a possible world as a modal index. It defines a world as a modal index but holds that not all worlds are possible worlds. More on this detail shortly.) Periods or stretches of time may be analyzed as collections of temporal points. But temporal points can not then be analyzed further without circularity. If, on the other hand, we analyze temporal points in terms of stretches of time as some kind of limits, we will then not be able to analyze stretches of time without circularity. The temporal indices as a whole are not subject to further analysis. The modal indices are subject to further analysis no more than the temporal indices. If you do not know intuitively what time is, no amount of conceptual explication will give you that knowledge. The concept of time is primitive. Temporal indices are locations on the temporal axis, but beyond that we cannot say anything informative about their nature. In this sense they are *sui generis*. Likewise, if you do not know intuitively what a world is, no amount of conceptual explication will give you that knowledge. The concept of a world is primitive. Modal indices are locations in the modal dimension, but beyond that we cannot say anything informative about their nature. In this sense they are *sui generis*.

All possible worlds are modal indices, but not all modal indices are possible worlds. All modal indices are worlds in the technical sense of 'world' relevant to modal semantics and related areas, but some modal indices are not possible worlds; that is, they are impossible worlds. What distinguishes those modal indices which are possible worlds from those which are impossible worlds? To answer this question, we start with a fundamental property of a modal index. Even though there is no definition of a modal index in terms of more primitive notions, we can say that a modal index is at least something such that truth relative to it is well defined. That is, a modal index is a truth relativizer. There are other truth relativizers, such as times and places. If we wish, we may say that modal indices are modal truth relativizers, times are temporal truth relativizers, and places are spatial truth relativizers. But of course, this is a hardly informative way to distinguish the three kinds of truth relativizers. If I am right about the primitiveness of these truth relativizers, there is no non-circular way to distinguish them. In any case, the important point here is that talk of truth at a modal index is intelligible. Suppose that the notion of a law of logic is independently intelligible. Then consider those

modal indices such that all truths at them obey all of the laws of logic. Call those modal indices *logically possible worlds.* When we speak of possible worlds, we usually mean logically possible worlds. Those modal indices which are not logically possible worlds are logically impossible worlds. Two questions may arise at this point. First, why do we need logically impossible worlds? Why do we not say simply that all modal indices obey all laws of logic? We need logically impossible worlds because without them we would not be able to account for a number of important items in terms of worlds, such as *reductio ad absurdum* (where the initial supposition is impossible to be true), counter-possible conditionals (where the antecedent is impossible to be true), the contents of some attitudinal states (where the attitude is directed to an impossible content), and some discourse on fiction (where the fictional story contains an impossibility), among others. The second question is, "How about other, more restricted kinds of possibility, such as metaphysical possibility, physical possibility, human psychological possibility, etc.?" Provided that each kind of possibility comes equipped with an appropriate notion of a law in some sense of 'law' that corresponds to the notion of a logical law for logical possibility, we can distinguish modal indices where all truths obey the laws in question from all other modal indices and call the former modal indices "possible worlds" in the appropriately restricted sense. There is no reason to believe that the appropriate notion of a law here *must* be defined in terms of possibility.

Thus Modal Dimensionalism does not define possible worlds in a circular manner. At the same time, it does not share the reductive fervor of Lewisianism, which analyzes possible worlds in terms of non-modal notions, or at least is intended to. Modal Dimensionalism leaves the notion of a world (i.e., modal index) primitive, and to that extent it does not, and is not intended to, offer a completely reductive analysis of possible worlds. The Modal Dimensionalist lives by the dictum that everything, including every world, is what it is and not something else. He therefore considers this disagreement with the Lewisian an advantage. This is somewhat ironic, for Lewis himself emphasizes that "[p]ossible worlds are what they are, and not some other thing" (Lewis, 1973: 85). He is, of course, speaking against Ersatzers. I believe Lewis himself is guilty of replacing worlds with some other thing.

The other defects of Ersatzism are also unshared by Modal Dimensionalism. The actual world according to Modal Dimensionalism is just another index in the modal dimension. It is the modal index at which the universe is the way it actually is, where the way the universe actually is is to be understood in an ostensive manner

that is analogous to the manner in which the present time is understood, by means of a typical use of the indexical word 'now'. To this extent, the Modal Dimensionalist agrees with the indexical theory of actuality. But, of course, the Modal Dimensionalist does not say that the actual world is any kind of mereological sum related to us. How should we then understand the rest of his indexical theory of actuality? There is really little left to understand, but to help ourselves get a better grip on the idea, I suggest that we coin a new word which designates the actual world in a way parallel to the way in which 'now' designates the present time. Let us say we invent the adverb '*mau*' for this purpose. The 'm-' is for 'modal' and the word rhymes with 'now'. So it is true to say, for example, that you are reading *mau* but could be swimming instead. (You are reading at the modal index that is the actual world but are swimming at another modal index. Some people prefer to pronounce the word '*mau*' as [*actually*].) The actual world is exactly the same kind of being as those indices at which you are swimming, or any other modal index. Such a being is not subject to Grim's neo-Cantorian argument.

Notice an interesting difference between the Lewisian indexical theory of actuality and the Modal Dimensionalist indexical theory of actuality. When we use the phrase, 'the actual world', what do we refer to? According to the Lewisian version, we refer to a concrete particular object. According to the Modal Dimensionalist version, we do not refer to any concrete particular object, any more than we do when we use the phrase 'the present moment'; the actual world is as basic an entity as the present moment. Thus, if the indexical theory of actuality is supported by the analogy with the indexicality of 'now', the Modal Dimensionalist version is better supported than the Lewisian version.

Ersatzism makes the universe inclusive of absolutely everything, even possible worlds. All possible worlds are (abstract) parts of the universe. In contrast, Modal Dimensionalism makes the possible worlds constitute the modal dimension in which the universe spreads out. This difference enables Modal Dimensionalism to escape the charge, which plagues Ersatzism, that 'Possibly donkeys talk' is given a wrong truth condition. On Modal Dimensionalism, 'Donkeys talk' is true at some possible world just if donkeys talk at some modal index. So 'Possibly donkeys talk' is true just if donkeys talk at some modal index. Thus, the Modal Dimensionalist truth condition for 'Possibly donkeys talk' directly involves donkeys.

How does Modal Dimensionalism avoid Actualist Skepticism? Note first that Lewisiansim identifies the actual world with more or less what I have been calling "the universe".

More or less, because I have not clearly distinguished the two conflicting uses of the phrase 'the universe'. One is the use in which 'the universe' is equivalent to the phrase 'the world we live in' as used by Lewis in his famous opening paragraph of *On the Plurality of Worlds*. Lewisianism identifies the actual world with the universe in this sense. The other is the use in which 'the universe' is equivalent to the phrase 'the totality of absolutely everything without any restriction whatever'. Ersatzism identifies the actual world with the universe in this sense. It is in this sense that absolutely everything exists in the universe, including all propositions and all possible worlds. Lewisianism denies that absolutely everything exists in the actual world. In particular, it denies that non-actual possible worlds or their inhabitants exist in the actual world. Therefore, it does not identify the actual world with the universe in this sense. (There are other senses of 'the universe' but I ignore them for convenience and compactness of discussion.)

Now, Modal Dimensionalism sides with Ersatzism in rejecting the identification of the actual world with the universe. At the same time, it sides with Lewisianism in rejecting the identification of the actual world with any (abstract) particular object (such as a set) existing within the universe. It claims that the actual world is merely the default index in the modal dimension in which the universe spreads. Unlike Actualist Skepticism, Modal Dimensionalism distinguishes the universe from the universe as it actually is. The universe as it actually is is that part of the universe which is modally located at the actual world, but the universe as a whole spreads throughout countless many other worlds as well. (Cf. The universe as it now is is that part of the universe which is temporally located at the present moment, but the universe as a whole spreads throughout countless many other moments as well.) Since Modal Dimensionalism, like Ersatzism, says that the universe as a whole provides the absolutely largest domain of discourse, it is immune from the skeptic's charge that a domain larger than the content of the universe is postulated for the modal operators to range over. According to Modal Dimensionalism, worlds simply are modal locations, which define the universe modally just as times define the universe temporally. Modal Dimensionalism differs from Ersatzism in postulating an additional dimension for the universe to have, but it does not postulate anything outside the universe itself. All possible worlds exist in the sense analogous to the sense in which all temporal locations (moments and periods of time) exist. The Actualist Skeptic's claim that anything (concrete) that is not part of a maximal sum related to us, if such exists, is part of actuality, is based on the thesis of Actualism that everything whatever (without any restric-

tion) is part of the universe as it actually is. Modal Dimensionalism denies this thesis but does not deny that everything whatever (without any restriction) is part of the universe. This is a significant improvement over the Lewisian response to Actualist Skepticism.

Possible talking donkeys exist in the sense analogous to the sense in which dinosaurs exist. Dinosaurs exist in the sense that they exist*ed*. We may do well to invent a modal equivalent of the tense indicator; say, the prefix '*mo-*' for "modal". We may then say that talking donkeys exist in the sense that they *moexist*. Dinosaurs existed at some past temporal locations. Talking donkeys *moexist* at some non-actual modal locations. In each case, the creatures are parts of the universe in a straightforward sense.

This leads to an attractive analysis of modality *de re*. You and I exist. You and I also existed and *moexist*. Non-actual possibility *de re* can be understood straightforwardly in terms of *moexistence*. For you to be not actually but possibly an accountant is for you to be an accountant not at the actual world but at some non-actual possible world, which means for you to *moexist* at some modal index and *mobe* (*mo*-be) an accountant at that index. No representation of you in a proposition is required. No counterpart of you is required.

IV. Not Disguised Lewisianism

Modal Dimensionalism is as realist as Lewisianism and shares many virtues with Lewisianism in opposition to Ersatzism. Despite what I said in the previous section, some might therefore be led to suspect that Modal Dimensionalism is nothing but Lewisianism with a new label. To allay any such lingering suspicion, let me give a quick list of the differences between the two theories I have already discussed. I shall then elaborate on two of the differences further.

(I)   Lewisianism is a reductive account of a world. Modal Dimensionalism is not.

(II)   Leiwisianism says that worlds are concrete particular objects. Modal Dimensionalism does not.

(III)   Lewisianism says that every part of the universe as it actually is is spatiotemporally connected to us here now. Modal Dimensionalism does not. In general, Lewisiamism says that every part of the universe as it could have been is spatiotemporally connected to every other part. Modal Dimensionalism does not.

(IV)   Lewisianism says that the sum of all possible worlds is the absolutely largest domain. Modal Dimensionalism does not.
(V)   Lewisianism says that every possible individual exists in just one world. Modal Dimensionalism does not.
(VI)   Lewisianism uses counterparts. Modal Dimensionalism does not.

I shall now elaborate on the last two points of contrast. Modal Dimensionalism says that the universe is spread out over modal indices, hence possible individuals are spread out as well; one and the same possible individual exists at many different worlds. There is a temporal analogy. Some people think that every individual exists only at a particular time. According to this view, no individual persists through time. Every individual is time-bound and at best has counterparts at other times. This view has a counter-intuitive ring to it. Other people, including Lewis, hold the more intuitive view that many individuals persist through time. Temporal persistence involves existence at different times. There are two competing theories of temporal persistence, i.e., competing theories concerning how individuals manage to exist at different times. Temporal Endurantism says that individuals exist at different times by wholly existing at each of those times. For an individual to wholly exist at a time is for every part of it to exist at that time. Temporal Perdurantism, on the other hand, says that individuals exist at different times by having different (temporal) parts at those times. Lewis is a Temporal Perdurantist. When it comes to modality, however, Lewis does not embrace the modal analog of Temporal Perdurantism. He does not even hold the modal analog of Temporal Endurantism. He rejects the idea that possible individuals persist from world to world through logical space. Instead he holds the modal analog of the counter-intuitive view of time-bound individuals; no possible individual persists through logical space.

As for Modal Dimensionalism, it is clear that it is committed to modal persistence of possible individuals; possible individuals exist at many worlds. Is it committed to Modal Endurantism, the view that possible individuals exist at different worlds by wholly existing at each of those worlds, or is it committed to Modal Perdurantism, the view that possible individuals exist at different worlds by having different (modal) parts at those worlds? The answer to both of these questions is "No". Modal Dimensionalism, as such, carries no particular commitment that favors one view of modal persistence over the other. I shall therefore remain

officially neutral between Modal Endurantism and Modal Perdurantism.[2] I, however, cannot remain neutral between Lewis's claim of world-bound possible individuals and the claim of modal persistence. I shall therefore briefly examine Lewis's reasons for denying modal persistence.

Lewis offers four objections against modal persistence as it is characterized (and attacked) by Quine in (Quine, 1976: 859-63). Lewis denies that any possible individual exists at different worlds. Does this mean that he denies that anything exists at different worlds? No. It is not that Lewis thinks that nothing at all exists at different worlds. He believes in the unrestricted application of mereology throughout logical space; for any part X of any world and for any part Y of any world, there is a mereological sum of X and Y. He is thus committed to the inclusion in his ontology of individuals having parts in different worlds. Such modally perduring objects do exist in logical space at large. What does he deny, then? He denies that such modally perduring things are interesting and worthy of our attention, for they are nothing but gerrymandered sums. Indeed, it is Lewis's view that all transworld sums are impossible objects, as every possible object must have all of its parts at just one world. To this, the Modal Dimensionalist would say that it is not obvious that no possible object has one part at one modal index and another part at another modal index, any more than it is obvious that no actual object has one part at one physical index (time/place) and another part at another physical index. But if the analogy between modal indices and physical indices is sufficiently weak, Modal Dimensionalist's defense of modal persistence appears to be undermined. This is where Lewis's four objections come in. The objections consist in pointing out four disanalogies between trans-temporal sums, which Lewis embraces, and trans-world sums, which he does not:

(1)   Temporal stages stand in the causal dependence relation, but world stages do not.

(2)   Short-range similarities hold between close temporal stages in a linear ordering, but this is not so with world stages.

(3)   Pathological cases, such as fusion, fission, gradual loss of identity, are rare with trans-temporal sums, but rampant with trans-world sums.

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[2] Modal Endurantism may or may not be vulnerable to an objection parallel to Lewis's objection against temporal endurantism. The idea is that Modal Endurantism appears to make accidental intrinsic properties problematic. See (Lewis, 1986: 198-210).

(4)   Trans-temporal sums that are persons are capable of collective self-interest, but trans-world sums of person counterparts are not. (Lewis, 1986: 217-20).

The Modal Dimensionalist replies:

(1')   There are two parts to the reply to (1). First, causal dependence certainly does not hold between world stages, but causal dependence is not essential to all worthy unifications of parts. It is not necessary for spatial unification: e.g., my right little finger does not causally depend on my left little finger in the relevant way. To this someone might say that what makes spatial unification worthy is that the spatial parts "are adjacent, stick together, and act jointly" (Lewis, 1986; 211), whereas objects from different worlds neither are adjacent, stick together, nor act jointly. But, as Lewis himself points out, cases of spatial unification where not all these conditions are met abound: e.g., a fleet consisting of ships not adjacent to one another or sticking together (Lewis, 1986; 211), and the student body of a distance-learning school. The second part of the reply to (1) is that causal dependence is not necessary for trans-world unification of certain beings to which Lewis himself pays ample attention, namely, properties, relations, and propositions. For example, Lewis identifies the property of squareness as the set of all and only square possibilia. Lewis understands the subset relation as mereological parthood. So, for him, squareness is the mereological sum of the singletons of square possibilia from countless different worlds. Causal dependence does not hold between these singletons or their sums.

(2')   Short-range similarities trivially hold between close world stages in a natural sense of 'close', namely, *similar*. It is true that there is no linear ordering of similar world stages, but this is hardly surprising, for the modal dimension is not supposed to be linear in the first place. Note that there is no unique natural linear ordering of similar spatial stages, either. The presence of a unique natural liner ordering of all indices is surely an accidental feature of a worthy unification.

(3')   Rarity of pathological cases holds for trans-temporal sums at the actual world but fails at countless non-actual possible worlds. This means that pathological trans-temporal sums are rare at the actual world but not in logical space at large. So, rarity of pathological trans-temporal sums is an accidental feature of worthy unification. Also, fusion, fission, and gradual loss of identity are commonplace with trans-spatial sums even at the actual

world, as Lewis would agree: e.g., freeways. So pathological cases are not rare in all worthy unifications, even at the actual world.

(4')   We are not always engaged in catering to the collective self-interest of all of our temporal stages. We sometimes do not even think about self-interest of our temporal stages more than a few days in the future: e.g., when we are young children. We cease to care about self-interest of many of our past temporal stages. To the extent to which we do cater to the collective self-interest of our temporal stages, we may be said to cater to the collective self-interest of our world stages as well. When we plan our future courses of action, we are engaged in catering to the collective self-interest of many of our future world stages that we think might be actual. We will not discount the welfare of our future world stages in our deliberation on action simply because they will not be actual. We will take it seriously as long as they might be actual for all we know. This does not mean, of course, that we evaluate the self-interest of all our future world stages equally. The less likely it is that a particular future world stage of ours we think is actual, the less weight we give to it. But we do not ignore the self-interest of our future world stages the way we ignore the self-interest of future stages of a complete stranger.

One motivation for Modal Dimensionalism is the often-noted structural similarity between modal logic and tense logic. Strong as this motivation is, we should not tread beyond where it properly leads us. It would be a serious mistake to be dazzled by the structural similarity between the two logics to presume that to every important trait of times there is a corresponding equally important trait of worlds. Worlds are not times. Unification of temporal stages work one way, but do not expect unification of worldly stages to work the same way. The analogy between worlds and times is very good, as far as it goes. But, do not expect it to be perfect. Not all indices are equal. Not even all physical indices are equal. Unification of spatial stages does not work the same way unification of temporal stages works, as we have observed above. We should compare modal logic not just to tense logic but to "locational logic" (logic of operators such as 'it is the case everywhere that' and 'it is the case somewhere that') as well. When we do, we will notice much less disanalogy between modal indices and physical indices than when we compare modal logic to tense logic only.

As part of the disanalogy mentioned in (2), Lewis adds that unification of world stages by a chain of short steps is too easy and therefore such unification must be accomplished by direct similarity (Lewis, 1986; 218). He is assuming that one way or another trans-world unification must be accomplished by means of similarity. The Modal Dimensionalist rejects this assumption. How trans-world unification is accomplished according to Modal Dimensionalism is an important question, which calls for a fuller treatment than I can give here.

V.   Epilogue

Modal Dimensionalism is a promising metaphysical theory of possible worlds. In this essay I have tried to launch it as a well-motivated theory. A full defense of the theory, however, will require much more. Let me mention a few topics in need of further discussion. The first is the distinction between worlds and possible worlds. What makes a world a possible world? I have sketched the difference between a world and a possible world in terms of what I called the laws, but have not said what they are exactly. The second and related topic is impossible worlds. The idea of an impossible world within a realist theory of worlds is *prima facie* absurd. I need to say more to dispel the initial absurdity and elaborate on the theoretical utility of impossible worlds. The third topic is trans-world unification. I have said how trans-world unification differs from trans-temporal unification in a number of respects. This has given us some idea about how trans-world unification should not be accomplished. But I have not given the slightest idea as to how it should be accomplished. A positive account is needed. The fourth topic is indices. I need to give a general theory of indices which subsumes theories of time, space, and worlds as particular cases. Such a theory will go a long way toward demystifying worlds as primitively characterized as modal indices. Finally, there is the question of modal epistemology. One objection against Lewisianism I did not discuss at all is the epistemological objection: "Lewisianism makes knowledge of modal matters impossible." Does Modal Dimensionalism, a fully realist theory, escape this objection? If so, how? The task of doing justice to these and related issues will be a welcome burden on defenders of Modal Dimensionalism.[3]

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