A MODAL-CAUSAL ARGUMENT FOR A CONCRETE NECESSARY OBJECT

JOSÉ TOMÁS ALVARADO
https://orcid.org/0000-0003-2324-8458
Pontificia Universidad Catolica de Chile
Department of Philosophy
Santiago
Chile
jose.tomas.alvarado@gmail.com

Article info
CDD: 160
Received: 16.07.2021; Revised: 11.10.2021; Accepted: 18.10.2021
https://doi.org/10.1590/0100-6045.2021.V44N4.JA

Keywords
Cosmological Argument
Ontological Argument
Causation
Modality

Abstract: Suppose that it is metaphysically possible that the mereological fusion of all contingent states of affairs has a cause. Whatever the nature of the state of affairs that causes such mereological fusion, it should be metaphysically necessary because, otherwise, it could be part of the mereological fusion it causes. It is possible, then, that there is at least one necessary state of affairs. This state of affairs is a causal relatum, so it must include at least one concrete necessary object. But if something is possibly necessary, then it is necessary because it is not metaphysically contingent whether something is necessary or doesn't. Then, it results that it is metaphysically necessary that there is, at least, a concrete necessary object. This work presents and discusses this argument.

Grant that it is metaphysically possible that the mereological fusion of all –and only– contingent states of affairs or events has a cause. Whatever the state of affairs or fact is the cause of such mereological fusion, it must be necessary because otherwise, it would be part of the fact caused. It is then possible that there is a metaphysically necessary fact. This fact is a causal *relatum*, so it must include at least some necessary object. But if something is possibly necessary, then it is necessary, for it is not metaphysically contingent whether or not something is metaphysically necessary. So, it turns out that it is metaphysically necessary that there is –at least– one metaphysically necessary object. This paper aims to present and discuss the viability of this argument.

Traditionally, theistic arguments –*i. e.*, arguments for the postulation of a necessary, infinite, eternal, omnipotent, omniscient, and perfect being that is the causal principle of everything else– have been classified as 'ontological', 'cosmological' and 'teleological' (see, for example, Oppy, 2006, 49-240). More recent explorations, nevertheless, have shown that the variety of ways and lines of argumentation is much more complex. The volume edited by Walls & Dougherty (2018) discusses more than twenty different justifications ranging from considerations about propositions, natural numbers, epistemological reliability to considerations about moral obligation and the nature of interpersonal love. There is even an argument based on the existence of 'so many arguments' (see, Poston, 2018). Pruss & Rasmussen (2018) discusses six main justifications but add another thirty in an appendix. Some of these justifications can be easily classified as specific forms of the traditional theistic defenses, but many others can't. The line of reasoning that is presented in this work is close to several versions of the cosmological argument that substitute the 'principle of sufficient reason' or a 'causal principle' by weaker premises (see Gale and Pruss, 1999; Rasmussen, 2010, 2011; Pruss and Rasmussen 2018, 69-109). As those, the argument that is discussed here relies in the interaction of considerations about causation, and modality, but it is not a form of cosmological argument. Traditionally, this type of justification has had as its central premise some empirical statement[1], but here, instead, the central premise is a thesis of metaphysical possibility for which –in principle– an *a priori* justification would suffice. No appeal is made here to a causal principle or a principle of sufficient reason[2]. On the other hand, although it is *a priori* reasoning –or so it seems– it does not conform to the typical forms of ontological argument. It does not depend on the 'concept' of God or the 'meaning' of the expression "God", but on the possibility of certain causal connections. As it will be explained below (see § 4), the argument presented here is not open to some

[1] See Rowe, 1998, 3. If, however, the most typical formulations are considered, the central premise is not always something clearly verifiable by experience. In some cases, it is the realization that there are things that move (cf. Aristotle, *Metaphysics* XII, 6; Saint Thomas Aquinas, *Summa theologiae* I, q. 2, a. 3 c.: *certum est, et sensu constat, aliqua moveri in hoc mundo*), but in others it is the realization that there are contingent entities (cf. Saint Thomas Aquinas, *Summa theologiae* I, q. 2. a. 3, c.: *invenimus enim in rebus quaedam quae sunt possibilia esse et non esse*) or different degrees of perfection (*Ibidem*: *invenitur enim in rebus aliquid magis et minus bonum, et verum, et nobile, et sic de aliis huiusmodi*). Something is contingent if it could not exist. The 'possibility not to exist', however, does not seem something that one can know empirically. The comparison of 'perfections' does not seem clearly evident to the senses either.

[2] See, Rowe, 1998, 60-114. In the weaker forms of cosmological argument there appears a causal principle or a principle of sufficient reason either epistemologically qualified (cf. Koons, 1997; Rasmussen, 2010) or modally qualified (Gale and Pruss, 1999; Rasmussen, 2010, 2011; Pruss and Rasmussen 2018, 69-109).

objections commonly raised against different modal versions of ontological argument.

Some distinguish a 'part I' and a 'part II' of a cosmological argument (see Rowe, 1998, 222-248). Part I would be the justification of a necessary entity –or a prime mover, or a pure act, etc.– while part II would be the justification of why an entity with the postulated characteristics possesses the further attributes that in the tradition have been assigned to God. The argument that is going to be discussed here will only cover 'part I'. It purports to justify that there is at least one concrete necessary object, but the question whether there is only one such object will not be addressed here. Neither will be considered here whether a concrete necessary object is infinite, omnipotent, eternal, omniscient or morally perfect.

In what follows, the argument will be presented in the first section (§ 1). As can be seen, there are several important assumptions to evaluate it. In particular, these assumptions have to do with the principle according to which what is possibly necessary is necessary (principle S5) and the central premise of metaphysical possibility. In the next section, we will explain why a necessary state of affairs that is a causal *relatum* of *m* must include at least one necessary concrete object (§ 2). It will be argued, then, why the principle S5 is reasonable (§ 3) and then what reasons one would have to accept the premise of possibility (§ 4). The main problem that the argument must face is the –apparent– plausibility of an 'inverse' or 'counter-possibility' thesis. This problem will be the subject of discussion in the fifth section (§ 5).

§ 1. **The argument**

I will assume that the variables 'x', 'y', 'z', ... range over states of affairs. A 'contingent' state of affairs is going to be expressed with the abbreviation '♣'. A contingent state of affairs is defined as follows:

(1) $♣x =_{\text{df}} (\Diamond\exists y\ (y = x) \wedge \Diamond\neg\exists y\ (y = x))$

A state of affairs that is not contingent is necessary. 'To be necessary' is expressed with the abbreviation '♠'. It is defined in terms of ♣, thus[3]:

(2) $♠x =_{\text{df}} \neg ♣x$

The term "m" is defined as the mereological fusion of all and only contingent states of affairs:

[3] This requires some comment, since strictly the negation of ♣ turns out to be –for a suitable value of 'x':

$\neg(\Diamond\exists y\ (y = x) \wedge \Diamond\neg\exists y\ (y = x))$

Which is equivalent by De Morgan's law to:

$\neg\Diamond\exists y\ (y = x) \vee \neg\Diamond\neg\exists y\ (y = x)$

Which is equivalent to:

$\Box\neg\exists y\ (y = x) \vee \Box\exists y\ (y = x)$

Note, however, that no object in the range of the quantifier can satisfy the first disjunct, that is, 'be necessarily non-existent'. Thus, the only way to satisfy ♠ is by satisfying the second disjunct:

$\Box\exists y\ (y = x)$

This is, in effect, what is to be assumed to be the meaning of "♠".

(3) $m =_{\mathrm{df}} (x\iota)\ \forall y\ ((y \bigcirc x) \leftrightarrow \exists z\ (\clubsuit z \wedge (y \bigcirc z)))$

That is, *m* designates that state of affairs with which any state of affairs *y* overlaps if and only if *y* overlaps with a contingent state of affairs. It is, therefore, the unique state of affairs that has all contingent events as parts and has only contingent events as parts. Note that *m* is not a rigid designator but a definite description of a state of affairs that is the sum of contingent states of affairs that obtain in a possible world. It designates different mereological fusions in other worlds. Hereafter, standard extensional mereology will be assumed (cf. Simons, 1987, 1-45)[4]. The definition of *m* depends on the mereological operation of 'overlapping' (¡). This operation is applied here to states of affairs and not on objects, which requires some clarification. In general, two objects 'overlap' if and only if they have at least one improper part in common, that is:

(4) $(o_1 \bigcirc o_2) =_{\mathrm{df}} \exists o_3\ ((o_3 < o_1) \wedge (o_3 < o_2))$

Here the variables 'o_1', 'o_2', and 'o_3' range over objects. The expression "<" is the predicate of 'being an improper part of'. An improper part of an object *o* is 'smaller' or identical to the object *o*. Thus, every object is trivially an improper part of itself. For the same reasons, every object trivially overlaps with itself. On the other hand, two objects are disjoint from each other ($|$) if and only if they do not overlap:

[4] Standard extensional mereology is usually characterized by the following postulates: (i) the relation of 'being a part of' is transitive; (ii) for any two entities there exists the mereological sum of them; and (iii) two mereological sums are identical if and only if they have exactly the same parts. For the identity of a mereological sum or fusion it is only relevant what are its parts and not what kind of configuration these parts have.

(5) $(o_1 \mid o_2) =_{\text{df}} \neg(o_1 \bigcirc o_2)$

For mereological fusions of states of affairs to make sense, overlaps between these states of affairs need to make sense. A state of affairs, fact, or situation –at least as they are understood here– consists of the fact that an object possesses a property at a time or that several objects are under a relation at a time. These are entities ontologically dependent on their essential constituents: the object (or objects), the property (or relationship), and the time that integrate it. By a 'time' it is meant a period that can be more or less extended. In the limiting case, it can be understood as an instant. The square brackets '[…]' will be introduced to designate 'the state of affairs that ...' The expression '$[P, o, t]$' designates, then, the state of affairs of object o instantiating the property P at the time t. The expression '$[R, o_1, \ldots, o_n, t]$' designates the state of affairs of objects $o_1, \ldots, o_n$ instantiating the relational property R at time t. Two states of affairs are the same state of affairs if they are the instantiation of the same property on the same object (or objects) at the same time. Two states of affairs overlap if and only if their constituent objects overlap and their constituent times overlap. Thus[5]:

(6) $([P_1, o_1, t_1] \bigcirc [P_2, o_2, t_2]) =_{\text{df}} ((o_1 \text{¡} o_2) \wedge (t_1 \text{¡} t_2))$

[5] Here, to keep things simple, it is defined only the overlapping between monadic states of affairs consisting of a single object possessing a monadic property at a time. The definition can be generalized for relational states of affairs that are made up of an arbitrary number of objects. Indeed, $[R_1, o_1, \ldots, o_n, t_1] \bigcirc [R_2, o_m, \ldots, o_{m+j}, t_2]$ if and only if any of the objects $o_1, ..., o_n$ overlaps with any of the objects $o_m, ..., o_{m+j}$ and time t_1 overlaps with time t_2.

As at one time an object must be located in some spatial region, a state of affairs also has a spatio-temporal location. A necessary condition for two states of affairs to overlap, then, is that their space-time regions are also overlapped. It can be seen here that the identity conditions of a state of affairs are the same as those postulated by Jaegwon Kim for 'events' (cf. Kim, 1976). States of affairs, as they are described, are potentially *relata* of causal connections. It can also be appreciated that states of affairs will be individualized as finely as the properties that constitute them. Here, it is supposed that properties are specified by the causal powers they confer on their instantiations and by the objective similarities grounded between objects that share them. There are, therefore, no negative properties. There are no correlatively 'negative facts' that are the instantiation of such negative properties[6].

The mereological sum of two states of affairs is also a state of affairs. If it is a state of affairs that o_1 is P_1 at t_1 and it is a state of affairs that o_2 is P_2 at t_2, it is also a complex state of affairs that o_1 is P_1 at t_1 and o_2 is P_2 at t_2. The same is true for the totality of contingent states of affairs existing at a possible world. The total fact m is also contingent since it is a mereological fusion of contingent facts, and the essence of a mereological fusion is determined by its parts. If one of those parts did not exist, the whole that that part makes up would not either. And each of its parts could not exist –by definition– so the entire m could also not exist.

Appeal is made now to first-order quantified modal logic without the Barcan Formula and the Converse Barcan

[6] It is not necessary for the purposes of this paper to make a decision about the nature of properties and objects. In principle, the argument presented here is independent of whether properties are universal, trope classes, or resemblance classes of objects. It is also compatible with different conceptions of particular objects.

Formula[7]. The argument relies on two premises, one of which has a crucial function. This premise ("**PP**" for short) is going to be called the 'possibility premise':

(**PP**) $\Diamond\exists x$ (x causes m)

That is, it is metaphysically possible that there is a state of affairs that causes *m*. Recall that variables range over states of affairs. The second premise concerns the nature of whatever it is a cause of *m*. It will be called the 'necessity premise' (abbreviated, "**PN**"):

(**NP**) $\Box\forall x$ ((x causes m) $\rightarrow \spadesuit x$)

(**NP**) states that it is metaphysically necessary that anything that is a cause of *m* is metaphysically necessary. This premise with which the metaphysical necessity of the cause of *m* is introduced can be justified, in turn, as a lemma which can be derived from the definition of *m* and the principle:

(7) $\Box\forall x\, \forall y$ ((x causes y) $\rightarrow$ ($x \mid y$))

That is, it is metaphysically necessary that if a state of affairs causes another, it is mereologically disjoint from its effect. Since any contingent state of affairs must, by

[7] The Barcan Formula ($\Diamond\exists xFx \rightarrow \exists x \Diamond Fx$) and the Converse Barcan Formula ($\exists x\Diamond Fx \rightarrow \Diamond\exists x\, Fx$) ensure that the range of quantification is constant at all possible worlds. Not introducing these assumptions, therefore, it is assumed that each possible world has assigned a domain of the objects existing at that world that may or may not coincide with the domain of objects at another possible world. See Hughes and Cresswell, 1996, 274-311; Cocchiarella and Freund, 2008, 119-182. Appeal will be made to a S5 modal logic, but this will be explained in detail below.

definition, be part of *m*, something that is disjoint from *m* must be necessary. The assumption that causes are disjoint from their effects has been introduced into all conceptions of causality in one way or another[8]. It has intuitive justification in the idea that nothing can cause itself. Granted premises (**PP**) and (**NP**), it follows that:

(8) $\Diamond\exists x \spadesuit x$

(8) results from an application of *modus ponens* –with the qualifications required– on (**PP**) and (**NP**). This derivation is presented in more detail in an appendix, as well as the derivation of (**NP**) from (7) and (3). Note now that, according to definition (2), (8) is equivalent to:

(9) $\Diamond\exists x \Box\exists y\ (y = x)$

Proposition (9) states that it is metaphysically possible that there is a metaphysically necessary state of affairs. (9) is still not the claim that there is actually a metaphysically necessary state of affairs, but this transition is ensured by the principle characteristic S5 modal systems:

(S5) $\Diamond\Box A \rightarrow \Box A$

---

[8] In regularity theories of causality, for example, the causal relationship between events *c* and *e* has been analyzed as the fact that: (i) all events of type *c* are regularly followed by events of type *e*; (ii) *c* is spatio-temporally contiguous with *e*; and (iii) *c* temporarily precedes *e* (cf. Psillos, 2002, 19). Recall that two events or facts overlap if and only if their objects and their times overlap. Two events that occur at different times, therefore, are non-overlapping. Then, they are events or facts mereologically disjoint.

According to (S5), if something is possibly necessary, then it is necessary. What is stated in (9) is that it is possible that there is something metaphysically necessary. By (S5), this implies that there is something metaphysically necessary, which is the conclusion of the argument (**C**):

(**C**) $\exists x \, \Box \exists y \, (y = x)$

This step should be considered with a little more care. The usual way of specifying the truth conditions of a statement with modal operators is by assuming that such a statement has a truth value in each of the different 'possible worlds'. Each of these 'possible worlds' is a way everything could be. The totality of possible worlds is represented by the set W. One and only one of the elements of W is how things actually are, which will be called 'w_0'. There is an 'accessibility' relation R between the elements of W. The 'accessibility' of one possible world with respect to another consists in the fact that the first world is a metaphysical possibility from the perspective of the second; that is, it consists in the fact that if things were as they are represented in the second world, then it would be metaphysically possible that things were as they are represented in the first world. Each possible world w is assigned a domain $D(w)$ of the entities existing at w that does not have to coincide with the domain $D(w')$ of the entities of another world w'. To connect language expressions and these 'possible worlds' and their 'inhabitants', an evaluation function '**V**' that assigns a truth value to each sentence of the language in each possible world is defined. This function assigns to each predicate of the language an 'extension' in each possible world w, which is the set of elements of $D(w)$ that satisfy that predicate. If it is an n-adic predicate, **V** will assign a set of elements of the n-th Cartesian product of elements of $D(w)$, that is, $D(w)^n$. For the individual constants of the language, on the other hand, a function '**den**' is introduced that assigns to each constant an individual of $D(w)$. Finally, an 'assignment' function **a** is introduced**,** which assigns to each free variable an object of $D(w)$. The expression '$\mathbf{a}[x/d]$' designates the assignment that differs from assignment **a** in that, at most, it assigns the object $d \in D(w)$ to the variable x, keeping all other assignments to variables identical.

Each sentence of the language in question, or each set of sentences in such language, then, can be interpreted by a structure **M** of this type:

$\mathbf{M} = \langle W, R, w_0, D, \mathbf{V}, \mathbf{den} \rangle$

M is a 'model' of a sentence A ($\vDash$) in the possible world w and under the assignment **a**, according to the following recursive specification:

$\mathbf{M}, w, \mathbf{a} \vDash A$ if and only if $\mathbf{V}(A, w) = 1$

Here 1 designates the value 'true' and 0 designates the value 'false'. Intuitively, this clause should be understood as indicating that, if things were as they are represented at w, then things would be just as sentence A says they are –that is, sentence A would be true.

$\mathbf{M}, w, \mathbf{a} \vDash \neg A$ if and only if it is not the case that $\mathbf{M}, w, \mathbf{a} \vDash A$

$\mathbf{M}, w, \mathbf{a} \vDash (A \wedge B)$ if and only if $\mathbf{M}, w, \mathbf{a} \vDash A$ and $\mathbf{M}, w, \mathbf{a} \vDash B$

These two clauses allow assigning truth values to sentences that result from applying logical connectives to other sentences in the language. Sentences that are not true at a possible world are sentences whose negations are true at those worlds. With these same clauses, truth conditions can be specified for any other propositional connective.

$\mathbf{M}, w, \mathbf{a} \vDash Fa_1, \ldots, a_n$ if and only if $<\mathbf{den}(a_1), \ldots, \mathbf{den}(a_n)> \in \mathbf{V}(F, w)$

The previous clauses assign truth values to complete sentences without considering their internal structure. This clause, though, allows the specification of truth conditions considering *what* is being said of *what* in a sentence. A sentence attributes the predicate F to the object denoted by the constant of individual a truly if and only if that object belongs to the extension of F at the possible world of evaluation. Recall that the evaluation function assigns to each predicate F an extension at each possible world $\mathbf{V}(F, w)$ which is, intuitively, the set of objects to which such a predicate is truly attributed.

$\mathbf{M}, w, \mathbf{a} \vDash \forall x\, A$ if and only if for all $d \in D(w)$: $\mathbf{M}, w, \mathbf{a}[x/d] \vDash A$

$\mathbf{M}, w, \mathbf{a} \vDash \exists x\, A$ if and only if there is a $d \in D(w)$ such that: $\mathbf{M}, w, \mathbf{a}[x/d] \vDash A$

These two clauses specify truth conditions for universal and existential quantifications. A universal quantization $\forall x\, A$ is true at a possible world w if it is true to say A of all the entities of w. An existential quantification $\exists x\, A$ is true at a possible world w if it is true to say A of at least one entity of w. Note how it is assumed here that each possible world w is assigned a specific domain of entities $D(w)$ that is not constant for all worlds.

$\mathbf{M}, w, \mathbf{a} \vDash \Box A$ if and only if for all $w' \in W$ such that wRw': $\mathbf{M}, w', \mathbf{a} \vDash A$

$\mathbf{M}, w, \mathbf{a} \vDash \Diamond A$ if and only if there is a $w' \in W$ such that wRw': $\mathbf{M}, w', \mathbf{a} \vDash A$

Finally, these two clauses specify truth conditions for sentences with modal operators of necessity or possibility. It turns out that the sentence A is necessary in the possible world w if and only if A is true in all possible worlds accessible to w –which are in relation R with w– and it is possible in the possible world w if and only if it is true in at least one possible world accessible to w –which is in relation R with w. The main characteristic of S5-type systems from the semantic point of view is that all possible worlds are accessible to each other without restrictions. Thus, the clauses for necessity and possibility turn out to be in S5 as follows because the introduction of the accessibility relation R plays no role:

$\mathbf{M}, w, \mathbf{a} \vDash \Box A$ if and only if for all $w' \in W$: $\mathbf{M}, w', \mathbf{a} \vDash A$

$\mathbf{M}, w, \mathbf{a} \vDash \Diamond A$ if and only if there is a $w' \in W$: $\mathbf{M}, w', \mathbf{a} \vDash A$

It can now be seen how (9) has as a logical consequence (**C**) if (S5) is assumed. That is, every model of (9) is also a model of (**C**). Suppose, in effect, that:

$\mathbf{M}, w, \mathbf{a} \vDash \Diamond \exists x\, \Box \exists y\, (y = x)$

This is equivalent to there being a $w' \in W$ such that:

$\mathbf{M}, w', \mathbf{a} \vDash \exists x \, \Box \exists y \, (y = x)$

This is equivalent to there being a $d \in D(w')$ such that:

$\mathbf{M}, w', \mathbf{a}[x/d] \vDash \Box \exists y \, (y = d)$

Which, in its turn, is equivalent to the fact that for all $w'' \in W$:

$\mathbf{M}, w'', \mathbf{a}[x/d] \vDash \exists y \, (y = d)$

Note that $d \in D(w')$, and there is no reason to assume that $D(w') = D(w'')$. But the application of the clause for $\exists y \, (y = d)$ gives us as a result that for all w'' there is a $d' \in D \, (w'')$ such that:

$\mathbf{M}, w'', \mathbf{a}[x/d][y/d'] \vDash (d' = d)$

What results, therefore, is that there is an entity $d \in D(w')$, that is, an entity existing in some possible world w' that is identical to an entity d' that belongs to *all the domains of all the possible worlds* –that is, it is identical to a $d' \in D(w'')$ for all w''. This entity is, then, simply necessary. Then, it can be seen that any model of (9) must also be a model of (**C**). The negation of (**C**) is:

(10) $\forall x \Diamond \neg \exists y \, (y = x)$

That is, all actual entities possibly don't exist. (10) has **M** as a model at the actual world w_0 –because the initial quantifier is not under the scope of some modal operator– and under an assignment **a** if and only if, for every entity $d \in D(w_0)$:

$\mathbf{M}, w_0, \mathbf{a}[x/d] \vDash \Diamond \neg \exists y \, (y = d)$

This is equivalent to there being a possible world $w \in W$ such that:

$\mathbf{M}, w, \mathbf{a}\,[x/d] \vDash \neg\exists y\,(y = d)$

Recall that this clause is valid for all $d \in D(w_0)$. The negation in question would have **M** as a model at w if and only if, for all the entities $d \in D(w_0)$, the following condition fails:

$\mathbf{M}, w, \mathbf{a}[x/d] \vDash \exists y\,(y = d)$

But it is clear that this condition should be true for at least one actual entity because there is at least one entity that is in the domain of every possible world, as required by any model of (9). There must be at least one entity d in the domain of entities $D(w_0)$ and in the domain of entities $D(w)$ for any w, against the assumption[9].

[9] The derivation can also be done, of course, using a calculus of natural deduction (cf. Garson, 2006, 1-54):

1	$\Diamond\exists x\,\Box\exists y\,(y = x)$	(9)
2	$\exists x\,\Box\exists y\,(y = x)$	$\Diamond$Out1
3	$\Box\exists y\,(y = x)$	$\exists$Out2
4	$\Diamond\Box\exists y\,(y = x)$	$\Diamond$In3
5	$\Diamond\Box\exists y\,(y = x) \rightarrow \Box\exists y\,(y = x)$	S5

It can be seen that in this reasoning, the fact that the world of evaluation is the actual world w_0 does not fulfill any special function. The same happens for any other possible world. It is not possible for all entities to be contingent if (9) is true, that is if there is at least one necessary entity, constant for all domains of all possible worlds. It is not required here to reiterate the whole reasoning, but just as (**C**) follows from (9), it also follows:

(11) $\Box\exists x \Box\exists y\ (y = x)$

That is, it is metaphysically necessary that there is a metaphysically necessary fact.

§ 2. **From a necessary state of affairs to a necessary object**

What follows from this argument, then, is that there is at least one metaphysically necessary state of affairs. But there are infinite necessary facts that are not pertinent to conclude that there is at least one necessary concrete object. It is a necessary fact, for example, that $\forall x\ (Fx \rightarrow Fx)$, that is, that everything is F if it is F. For this necessary fact, no single object is required that is constant in all domains at all possible worlds. It may happen that all objects exist in some domains and not in others, which does not prevent each of

6	$\Box\exists y\ (y = x)$	MP5,4
7	$\exists x\Box\exists y\ (y = x)$	$\exists$In6

The semantic reasoning that has been done above, however, seems more useful to make perspicuous the reasons why conclusion (**C**) under the assumption of (S5) should be accepted.

them –in their respective domains– from being *F* if they are *F*. These kinds of examples can be multiplied *ad nauseam*. Moreover, if the argument that has been put forward purports to offer a justification for admitting facts like these, it seems perfectly useless.

However, what has been justified is that there is at least one necessary fact that is the cause of all (and only) contingent facts in a possible world. Whatever the nature of such an event, it must therefore be the *cause* of something. The metaphysics of causality is an area in which almost everything has been disputed. For the purposes of this argument, philosophical assumptions about causation should be minimal, but some must be admitted anyway. A state of affairs that is the cause of *m* must be a 'positive' state of affairs consisting of one or more objects possessing a property. What traditionally has been held is that the necessary principle of the entire reality is a single object, but –as it has been already mentioned above– it is only supposed here that there is at least one necessary object. Neither an 'absence' nor a tautological fact such as the fact that $\forall x\,(Fx \rightarrow Fx)$ could be cause of *m*, as will be explained below. The identity conditions of a state of affairs are determined by its constituents. Then:

(12) $([\,P_1, a_1, \ldots, a_n, t_1] = [P_2, a_i, \ldots, a_{i+j}, t_2]) \rightarrow ((P_1 = P_2) \wedge (a_1 = a_i) \wedge \ldots \wedge (a_n = a_{i+j}) \wedge (t_1 = t_2))$

A necessary state of affairs must exist identically in all possible worlds. Given the identity conditions of a state of affairs, if it exists at all possible worlds, its constituents must also exist at all possible worlds. Thus, whatever the nature of the fact that causes *m* in a possible world, what follows from the argument is that the object (or objects) involved in that fact must exist at all possible worlds if the fact in question is necessary.

A 'tautological' fact such as that $\forall x\ (Fx \rightarrow Fx)$ could not be the cause of *m*. This fact is necessary, but it has as constituents each and every one of the objects –actual and merely possible– at each of their times of existence. It is an 'all-encompassing' fact that includes all the complete space of metaphysically possible objects. It is a state of affairs whose spatio-temporal location is the totality of times and spaces. According to the definition of overlapping for states of affairs, this 'all-encompassing' fact then overlaps with all contingent states of affairs. There are less 'comprehensive' necessary facts, such as the fact that $\exists x\ (Fx \rightarrow Fx)$, which includes as a constituent some object in the times of its existence, which does not have to include all objects and all times. It is also a state of affairs that overlaps with the contingent states of affairs of which the object –or objects– in question is constituent. Any of these 'tautological' facts do not satisfy the condition of being disjoint from *m*.

What could cause *m*, then? Its internal structure is not something that can be directly deduced from the premises of this argument. In the philosophical tradition, it is assumed that it is simply the existence of a concrete object; let it be Ω. If a time is to be assigned to the fact of existence of Ω, it should be the totality of all times –or the mereological fusion of all times– but it has been argued that the mode of existence of Ω is eternal. Indeed, 'eternity' is not a temporary mode of existence. Therefore, it is more prudent to omit the temporal parameter in the fact of existence of Ω. Following the notation introduced above, this fact would be:

$$[\lambda x\ \exists y\ (y = x), \Omega]$$

As has been done so far, 'existence' is represented as 'being an x identical with some entity that is in the range of quantification' ($\lambda x\, \exists y\, (y = x)$). It seems obvious that something has to 'belong to the range of quantification' because it exists and not the other way around. For this reason, the fact of existence of Ω would have to be something more fundamental, but it is not necessary to develop this question here[10].

Many reductive conceptions of causality have postulated that causes make the occurrence of their effects necessary. In regularity theories, the occurrence of the effect is a logical consequence given a basic regularity –which has been identified in such conceptions with a natural law (cf. Psillos, 2002, 19-23; 137-158; 215-239). In counterfactual theories, the causal connection is the fact that if the cause occurred, the effect could occur, and if the cause did not occur, the effect could not occur (cf. Lewis, 1973b). In the counterfactual theory, there is no necessity *simpliciter* for the effect given the cause, but there is the type of restricted necessity that is counterfactual dependence. There are, however, well-known difficulties with the assumption that a necessary entity is the cause –or the 'explanation'– of contingent events if causality implies making the occurrence of the effect necessary (cf. Pruss, 2006, 97 -125). If something is necessarily followed from a necessary fact, then the effect is also necessary and not contingent. Therefore, what will be assumed here is that effects depend ontologically on their causes so that the effect could not

[10] According to the thesis of divine simplicity, Ω does not have parts, nor does it have a structure with a substrate and properties (cf. Dolezal, 2011). Ω could be understood as a single trope, so the fact [$\lambda x\, \exists y\, (y = x)$, Ω] would not be structured by a property and an object, but rather would be a single simple constituent that is, at the same time, object and particular property. It would simply be [Ω] = Ω.

occur if the cause did not exist. The cause, however, does not make the occurrence of the effect necessary, nor does it even make the occurrence of the effect more probable. This supposition does not agree very much with reductivist conceptions of causality, but –as indicated above– not any theory of causality is suitable for this argument.

§ 3. **The principle (S5)**

It has been seen that the modal principle (S5) plays a central role in the derivation of (**C**). It is a principle preferred by many philosophers to characterize metaphysical modality, that is, the modality that has to do with what could happen and with what could not fail to happen. There are developments of events and processes that, objectively, could unfold, or could have unfolded, given the potentialities and causal powers of the objects involved. Such possibilities do not depend on our knowledge or our beliefs. Metaphysical modality is the space of these possibilities. What reasons are there for accepting S5 as a characteristic principle for metaphysical modality? Other modal systems are weaker than S5 but contain principles that seem fundamental to metaphysical modality. It will be helpful to consider what rejecting (S5) would entail. Its denial would be to admit that there could be some proposition B for which:

(13) $\Diamond\Box B \wedge \Diamond\neg B$

That is, there could be a possibly necessary but possibly false proposition *B*. An equivalent formulation of (S5) is[11]:

(14) $\Diamond A \rightarrow \Box\Diamond A$

Rejecting (14) implies admitting that there could be a proposition *B* such that:

(15) $\Diamond B \wedge \Diamond\Box\neg B$

That is, *B* would be possible, but possibly impossible. These are situations in which the fact that something is necessary or impossible is, in itself, something contingent. Indeed, something actually possibly true might be impossible, and something possibly false might be necessary. This seems counterintuitive enough to me. The fact that a fact or state of affairs is necessary or contingent cannot be something contingent.

There is a slightly more elaborate way of seeing why it is reasonable to accept the principle (S5). From a semantic point of view, a logic with (S5) as an axiom requires that the accessibility relations between possible worlds be reflexive, symmetric, and transitive; that is, it requires accessibility to be an equivalence relation. All possible worlds that are connected by accessibility relationships must be accessible to each other. It is obvious that metaphysical modality requires the reflexivity of relations of accessibility. If something is necessary in the possible world *w*, it must be true in *w* –*ab necesse ad esse valet consequentia*–, if something is the case, it must be possible that it is the case –*ab esse ad posse valet*

[11] Indeed, the contrapositive of (S5) is: $\neg\Box A \rightarrow \neg\Diamond\Box A$. This formula is equivalent to: $\Diamond\neg A \rightarrow \Box\Diamond\neg A$.

The formula (14) above follows substituting $\neg A$ by A.

consequentia. The logics that assume accessibility relations that are not only reflexive but also symmetric add as an axiom:

(16) $A \rightarrow \Box\Diamond A$

These logics are called 'B systems'[12]. If, on the other hand, it is assumed that accessibility relations are transitive as well as reflexive, it is added as an axiom:

(17) $\Diamond\Diamond A \rightarrow \Diamond A$

[12] Indeed, suppose (16) were false. There should be a possible world w_1 in which $A \wedge \Diamond\Box\neg A$. Then there should be a possible world w_2 accessible from w_1 at which $\Box\neg A$; this is what makes true at w_1 that $\Diamond\Box\neg A$. But if accessibility relationships are symmetric, then w_1 must be accessible from w_2. In w_2, however, $\Box\neg A$, so at all worlds accessible from w_2, A must be false. So, at w_1 A must be false and not true. Another equivalent formulation of the characteristic axiom of B is: $\Diamond\Box A \rightarrow A$. This formula will be used below.

These logics are called 'S4 systems'[13]. Principle (S5) can be derived from (17) and (16)[14]. Therefore, one way to make

---

[13] Indeed, suppose (17) were false at a possible world w_1. At this possible world should be the case that $\Diamond\Diamond A \wedge \Box\neg A$. So, there must be a possible world w_2 accessible from w_1 at which $\Diamond A$ –this is what makes true that $\Diamond\Diamond A$ at w_1. There must then be a possible world w_3 accessible from w_2 at which A is true –this is what makes $\Diamond A$ true at w_2. But, if accessibility relations are transitive, the world w_3 must be accessible from w_1, since w_3 is accessible from w_2 and w_2 is accessible from w_1. It happens, however, that in w_1 $\Box\neg A$, so A must be false at all worlds accessible from w_1, which includes w_3. Thus, A must be false and not true in w_3. An alternative formulation of the characteristic axiom S4 is: $\Box A \rightarrow \Box\Box A$. This latter formula will be used below.

[14] Indeed, suppose by hypothesis that $\Diamond\Box A$:

1	$\Diamond\Box A$	Hypothesis
2	$\Box A$	Out$\Diamond$1
3	$\Box A \rightarrow \Box\Box A$	S4
4	$\Box\Box A$	MP3,2
5	$\Diamond\Box\Box A$	In$\Diamond$2
6	$\Diamond\Box\Box A \rightarrow \Box A$.	(Axiom B)
7	$\Box A$	MP6,5

perspicuous why it is reasonable to accept (S5) is to consider why it is reasonable to assume that accessibility relations are symmetric and transitive. Consider first symmetry. If world w_2 is possible from the perspective of world w_1, then world w_1 must be possible from the perspective of world w_2. Suppose a dice is rolled. Anyone of its six sides can result. Suppose that in world w_1, the die is rolled, and a two is rolled. From the perspective of w_1, it seems perfectly possible that the dice roll would have resulted in a four and not a two. Let w_2 be the possible world in which a four is rolled. This world is accessible from w_1. It now appears that from the perspective of w_2, it is also perfectly possible that having the die rolled, a two would have come out and not a four. That is, world w_1 is accessible from the perspective of world w_2. These types of cases can be generalized. When it comes to events or processes whose development is –in some sense– 'open', that is when there is a plurality of different ways in which a process could unfold from the perspective of the possibility of one of those forms of development, other forms of development are also possible. When it comes to appreciating the reasonableness of the transitivity of accessibility relations, it is enough to complicate the example presented above just a little. Let be a possible world w_3 accessible from the perspective of w_2 in which rolling the die gives a six instead of a four. This world w_3 is immediately accessible from w_1 since from the perspective that a two comes out, it seems perfectly possible that a six comes out

---

8. $\Diamond\Box A \rightarrow \Box A$ Conditionalization 1,7

In this derivation (S4) has been introduced with a formulation equivalent to (17). Also (B) has been introduced on line 6 with a formulation equivalent to (16).

instead of a two. If a course of events is possibly possible, then it is possible.

The cases that have been described above of something possibly necessary, although possibly false, or something possibly impossible, but possibly true, are then not coherent if the accessibility relationships are symmetric and transitive, as explained. Indeed, suppose $\Diamond\Box B \wedge \Diamond\neg B$ at possible world w_1, then there is a possible world w_2 accessible from w_1 at which $\Box B$ –this is what makes true that $\Diamond\Box B$ at w_1. There is also a possible world w_3 accessible from w_1 at which $\neg B$ –this is what makes $\Diamond\neg B$ true at w_1. The point here is that possible world w_1 must be accessible from w_2 by the symmetry of accessibility. Therefore, w_3 is also accessible from w_2 by the transitivity of accessibility. But at w_2 $\Box B$, so B must be true at all possible worlds accessible from w_2, which includes w_3, so B must be true and not false at w_3. Something similar happens if a model is sought for $\Diamond B \wedge \Diamond\Box\neg B$. Suppose it were true at world w_1. So, there is a world w_2 accessible from w_1 in which B –this is what makes $\Diamond B$ true in w_1. There is also a world w_3 accessible from w_1 at which $\Box\neg B$ –this is what makes $\Diamond\Box\neg B$ true at w_1. It now happens that w_1 must be accessible from w_3 by the symmetry of accessibility. Then w_2 must be accessible from w_3 by the transitivity of accessibility. But at w_3 $\Box\neg B$, so B must be false at all worlds accessible from w_3, which includes w_2. So, in w_2, B must be false and not true after all.

§ 4. **The premise of metaphysical possibility (PP)**

Up to now, it has been shown how it is that from the premises of possibility (**PP**) and necessity (**NP**), the desired conclusion (**C**) follows if one accepts an S5 logic for metaphysical modality. The conclusion (**C**) is that there is at least one necessary state of affairs that is the cause of all contingent states of affairs. It has been discussed above why it is reasonable to suppose that a necessary state of affairs that is the cause of *m* requires the existence of at least one necessary concrete object. It has also been argued that it is reasonable to admit the principle (S5) for the metaphysical modality. The premises, then, are a reason to admit that there is at least one concrete object necessary. The premise (**NP**) seems, by itself, pretty safe. If there are reasons to be cautious, those reasons have to do with the premise of possibility (**PP**).

Of course, one could try to justify the premise of possibility (**PP**) from other principles. For example, one reason for holding that *m* possibly has a cause because it is a necessary fact that every contingent state of affairs has a cause, or it is a necessary fact that every contingent state of affairs possibly has a cause. These forms of 'principle of causality' have already been exploited for different forms of cosmological argument (cf. Gale and Pruss, 1999; Rasmussen, 2010, 2011; Pruss and Rasmussen 2018, 69-109). If, ultimately, this argument requires a principle of causality –with some modal weakening, perhaps– it would add nothing to those proposals[15]. One could also justify the possibility premise (**PP**) holding that there is actually a cause of all contingent facts –resting on the principle $A \rightarrow \Diamond A$. But if we had independent evidence that there is

[15] These versions of cosmological arguments, especially the versions of Rasmussen, 2011 and Pruss and Rasmussen, 2018, 69-109, seem completely acceptable to me. I also have no problems with a cosmological argument that depends on a 'strong' principle of causality. The advantage of the argument developed here is that it does not depend on any version of the causal principle, not even a weakened one. This is an argument that calls for far more modest assumptions.

actually a cause of *m*, this whole argument would be an idle excursion into subtleties about possible worlds that add nothing to what has already been justified in the beginning. The advantage of the argument being made here is that it requires a very modest premise of possibility. Why should we accept it? Our capacities to conceive –and, in some cases, imagine– have generally been held to be a cognitive mechanism for accessing metaphysical possibilities. Since these possibilities are objective and do not depend ontologically on our epistemic states, however, it is immediately added that what we can conceive of is a *defeasible* justification for metaphysical possibilities. We have many examples in the history of science of scenarios that we have thought possible but are not or deemed impossible, but that finally turned out possible. What we can conceive at a time depends on what conceptual resources are available at that time. Those resources may have different limitations. For example, in the seventeenth century, a non-Euclidean space-time did not seem possible. No one was in a position to conceive such a thing. Today it is not only considered possible but something empirically justified.

We can adduce in favor of (**PP**) our intuitions. Usually, if considering a scenario, we find no inconsistency in it, we are inclined to think that the scenario is metaphysically possible. It is obvious that this mechanism of 'imaginative inspection' or 'representative inspection' is far from infallible. It can easily happen that we lack imagination or that there are alternatives that we cannot conceive. On the one hand, it seems difficult to deny the premise of possibility (**PP**), that is, to argue that:

(18) $\Box\neg\exists x$ (x causes m)

The negation of (**PP**) states that it is metaphysically necessary that *m* does not have a cause. Whatever may be the totality of contingent events at a possible world, by its nature 'repels' the existence of a cause. Even if one adopts some reductive conception of causality, it does not seem reasonable to postulate such a thing. Reductivist conceptions of causality assume that any entity can exist jointly or separately from any other if they are different existents. If one supposes that the basis for the facts about causal relations and natural laws are entities independent of each other, it would be very extravagant to postulate a 'metaphysical repulsion' towards causal antecedents. The denial of (**PP**), then, is an extraordinarily strong metaphysical thesis and not very plausible even for those who defend reductivist views of causality.

The most severe problem to accept (**PP**), however, does not have to do with the reasonableness of directly denying this premise of possibility but rather has to do with the apparent reasonableness of a thesis of 'inverse' possibility. Indeed, consider this proposition that is going to be called a 'counter-possibility' proposition –abbreviated "**CP**":

(**CP**) $\Diamond \neg \exists x\, (x \text{ cause } m)$

What (**CP**) states is that it is metaphysically possible that *m* does not have a cause. It seems as weak a premise as (**PP**). The justification it seems to have is also our intuition that there is no inconsistency in a scenario where *m* has no cause, just as there appears to be no inconsistency in a scenario where *m* does. Since (**PP**) –together with (**NP**) and (S5)– imply the existence of a necessary state of affairs, the only way to make (**CP**) coherent with (**PP**) is by supposing that in the possible world in which *m* has no cause the same necessary state of affairs exists because it is the causal antecedent of *m* at other possible worlds. It would be that *m* would have $[\lambda x\ \exists y\ (y = x), \Omega]$ contingently as a cause, which is not very consistent with our traditional assumptions about a necessary concrete object that is the causal principle of all contingent entities.

There are analogous problems in other arguments for a necessary concrete object. Consider the modal ontological argument (cf. for example, Sobel, 2004, 81-114). As above, the required concrete object will be designated as 'Ω'. The variable '*o*' has objects as range. The argument requires two premises:

(19) $\Box(\exists o\ (o = \Omega) \rightarrow \Box\exists o\ (o = \Omega))$

(20) $\Diamond\exists o\ (o = \Omega)$

The premise (19) establishes that Ω if it exists, must be an entity *a se*, that is, it is an object that exists necessarily by itself. Premise (20) postulates the possibility of such an entity. It is not difficult to see that, given (S5) and following a reasoning similar to that followed here, it follows that: ¨$\exists o\ (o = \Omega)$. It has been argued here that, as plausible as (20) is the thesis of 'inverse' possibility:

(21) $\Diamond\neg\exists o\ (o = \Omega)$

That is, it is possible that Ω does not exist. If Ω is a necessary object, however, (21) must be false and not true. In this way, since Ω, if it exists, must exist necessarily, if it is possible that it does not exist, then it is an impossible object. We, therefore, have two symmetric arguments. The first uses (19) and (20) to derive the necessary existence of Ω. The second uses (19) and (21) to derive the impossibility of Ω. The problem is that (20) and (21) seem equally plausible.

Another case where we have a similar problem is with the argument of Duns Scotus in the *Tractatus de primo principle* (*Works*, 624-632). Grant a weak version of the principle of causality:

(22) $\Box \forall x\ (\clubsuit x \rightarrow \Diamond \exists y\ (y \text{ cause } x))$

That is, it is metaphysically necessary that every contingent state of affairs possibly has a cause. The contrapositive of (22) is:

(23) $\Box \forall x\ (\Box \neg \exists y\ (y \text{ causes } x) \rightarrow \spadesuit x)$

That is, it is metaphysically necessary that if a state of affairs is necessarily uncaused, then that state of affairs must be necessary. Duns Scotus introduces a premise of possibility like this:

(24) $\Diamond \exists x\ \Box \neg \exists y\ (y \text{ cause } x)$

That is, it is metaphysically possible that a necessarily uncaused fact exists. By a familiar reasoning, it follows, assuming S5 and (23), that there is a necessary state of affairs. The problem, however, is that as plausible as (24) is:

(25) $\Diamond \neg \exists x\ \Box \neg \exists y\ (y \text{ cause } x)$

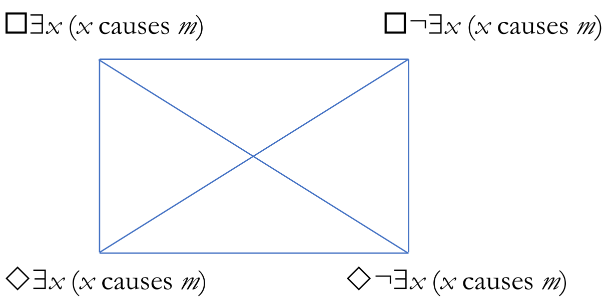
That is, it is metaphysically possible that *there* is *no* necessarily uncaused state of affairs. A necessary entity cannot be 'necessarily uncaused' in some possible worlds and not in others –at least if S5 is assumed as it is done here. If it is 'necessarily uncaused', it is because in no possible world it is caused. If it is not 'necessarily uncaused' –even in a possible world– it is because there is at least one possible world in which it is caused. Thus, propositions (24) and (25) are incompatible, but both appear to be equally acceptable.

A first point that should be highlighted in the analogy between the argument presented here and the situations that are generated in the modal ontological argument and in the Scotist argument is that (**PP**) and (**CP**) are not incoherent with each other, as is the case in the other cases. (**PP**) –together with (**NP**) and (S5)– implies the existence of a necessary state of affairs that is the cause of *m* in at least one possible world, let it be w_2. (**CP**) states that *m* has no cause in some possible world, let it be w_1, which, in itself, does not imply that there is no necessary state of affairs in w_1 that is the cause of *m* in w_2. (**CP**) is compatible with the existence of a necessary state of affairs, therefore, as follows from (**PP**). The problem that (**CP**) generates is that it imposes a 'strange' causal connection between the necessary fact $[\lambda x\, \exists y\, (y = x), \Omega]$ and *m*. Jointly admitting (**PP**) and (**CP**) implies assuming that $[\lambda x\, \exists y\, (y = x), \Omega]$ causes *m* contingently, even though $[\lambda x\, \exists y\, (y = x), \Omega]$ is necessary[16]. For cosmological arguments –as it has been indicated above– a distinction has been made between a 'part I' and a 'part II' (cf. Rowe, 1998, 222-248). Part I would be the justification of a necessary entity while part II would be the justification of why an entity with the postulated

[16] This formulation can be confusing. It has traditionally been held –at least in Jewish, Christian and Islamic traditions– that $[\lambda x\, \exists y\, (y = x), \Omega]$ contingently causes the world, as it might not have created it. In neither of these traditions, however, would it be admitted that the world could exist without causally depending on $[\lambda x\, \exists y\, (y = x), \Omega]$. What follows from the conjunction of (**PP**) and (**CP**) is not simply that *m* could not exist –which is obvious– but that *m* could exist, together with $[\lambda x\, \exists y\, (y = x), \Omega]$, without *m* having $[\lambda x\, \exists y\, (y = x), \Omega]$ as a cause, nor any cause.

characteristics possesses the attributes that in the tradition are assigned to Ω. The argument explained here is not strictly a 'cosmological' argument, but the same distinction can be made. What has been developed is a 'part I' that makes it possible to justify the existence of a necessary entity. It remains to be justified that such a being is also omnipotent, eternal, omniscient, and supreme goodness. The problem posed by (**CP**) affects 'part II' and not 'part I'.

Secondly, it will be convenient to consider the systematic connections between (**PP**), (**CP**) and their negations. A square of oppositions can be constructed between these propositions:



It can be seen that (**PP**) and (**CP**) are sub-contrary, so the falsehood of one of them implies the truth of the other, but the truth of one of them does not imply the falsehood of the other. (**PP**) is contradictory to □¬∃*x* (*x* causes *m*), as indicated above. (**CP**) is, on the other hand, contradictory of □∃*x* (*x* causes *m*). The problem that arises here is that (**PP**) does not determine, by itself, which of the pair of contradictory propositions should be accepted, whether (**CP**) or □∃*x* (*x* causes *m*). This does not mean, however, that there is no way to settle the issue. It is simply that this issue cannot be adjudicated only from (**PP**).

Third, it should be noted that the scenario in which *m* exists, $[\lambda x\, \exists y\, (y = x), \Omega]$ exists, but in which $[\lambda x\, \exists y\, (y = x), \Omega]$ is not a cause of *m* is unlikely independently. A minimally exhaustive examination cannot be made here of all the ways in which a scenario can be conceived in which (**PP**) and (**CP**) are jointly true, according to different conceptions of causality and modality. One can, however, consider how such a scenario would be intelligible according to three views of the nature of the causal relationship. For example, suppose one maintains that causality is regularity of events. In that case, it is trivial in possible worlds in which *m* is preceded by a necessary fact – since it must be disjoint from *m*– the regularity according to which every event of the type of the necessary cause fact is followed by a fact of the type of *m* obtains. Of course, there is only one case of the necessary fact and one case of *m*, but this is enough to make the regularity true. Regularity prohibits an event of the type of the necessary fact not succeeded by a fact of the type of *m*, but this would not happen in such a case[17].

On the other hand, if one were to hold a counterfactual conception of causality, it would also happen that *m* would be caused by the necessary fact at a world *w*, if the worlds closest to *w* –that is, the worlds most similar to *w*– are worlds in which, if the necessary fact exists, *m* exists, and if the

[17] Indeed, the regularity would be of the form: $\forall x\, ((x \text{ is of the type of } \Omega) \rightarrow \exists y\, (y \text{ is of the type of } m))$. This regularity is not satisfied if there is at least one event of type Ω, but there is no event of type *m*. In a world in which $[\lambda x\, \exists y\, (y = x), \Omega]$ is followed by *m*, the regularity is satisfied, even if there is only one event $[\lambda x\, \exists y\, (y = x), \Omega]$ and a single event *m*.

necessary fact does not exist, there is no *m*. And this, in effect, is satisfied. According to the formulation of Lewis (1973 b), the event *c* causes the event *e* at the world *w* if and only if: (i) if *c* does not exist, then *e* could not exist, and (ii) if *c* exists, *e* could exist. If, in fact, events *c* and *e* exist at *w*, the conditional (ii) is trivially satisfied –at least in Lewis' semantics for counterfactual conditionals. The hypothesis being considered is that (**CP**) is true in a way consistent with (**PP**), *i.e.,* there exist [$\lambda x\, \exists y\, (y = x), \Omega$] and *m*, which determines the satisfaction of the conditional (ii) immediately[18]. The counterfactual conditional (i) is true in *w* if and only if at all possible worlds closest to *w* in which *c* does not exist, *e* does not exist either. Possible worlds are 'closer' or 'further away' from each other according to their mutual similarities considered globally. It happens, though, that the hypothesis that (**CP**) is true is the hypothesis that there is a possible world *w* such that there is at least one possible world closer to *w* in which [$\lambda x\, \exists y\, (y = x), \Omega$] does not exist, but *m* does. But [$\lambda x\, \exists y\, (y = x), \Omega$] is necessary, so there are no such possible worlds. It can be seen, then, that any interpretation of (**CP**) in coherence with (**PP**) requires supposing that there must be a counterfactual dependence between [$\lambda x\, \exists y\, (y = x), \Omega$]

[18] In Lewis' semantics for counterfactual conditionals, by the so-called 'weak centering' principle, if propositions *p* and *q* are true at *w*, the conditional ($p \Box\!\!\rightarrow q$) is also trivially true (cf. Lewis, 1973a, 26-31). Nevertheless, it has seemed to many that the truth conditions for a counterfactual with true antecedent and consequent should be analogous to the truth conditions of a conditional with false antecedent. But if one assumes such a thing, it happens that in all the closest worlds in which [$\lambda x\, \exists y\, (y = x), \Omega$] exists, there is also *m*. Indeed, any possible world without contingent facts will count as more 'distant' from the world of evaluation than a world with contingent facts.

and *m*. According to a counterfactual conception of causality, then, any world in which $[\lambda x\ \exists y\ (y = x), \Omega]$ and *m* exist is a world in which $[\lambda x\ \exists y\ (y = x), \Omega]$ causes a *m,* against (**CP**).

Other conceptions of the causal relationship understand it as a primitive relationship of ontological dependence, not reducible to other facts that are more basic, whether they are regularities, counterfactual facts, or probability distributions (cf. Carroll, 2009). For these conceptions, regularities, counterfactual facts, or probability distributions are grounded in the existence of causal connections and not something to which such connections can be reduced. The reductionist theories need to establish causality in other facts because the causes, considered by themselves, do not determine nor necessitate the effects. Therefore, something additional is required to ensure the passage from cause to effect since causes are inert. Regularities or counterfactual facts –which are, in Lewis metaphysics, facts about the similarity and dissimilarity between possible worlds– are supposed to provide this supplementation. Non-reductivist theories, on the other hand, do not require any ontological support to give causes the power to make their effects effective. Causes are effective by their very nature. It has been explained above that what is coherent with the argument that has been explained here is that the effects depend ontologically on their causes so that these effects would not exist if their causes did not exist, even when these causes do not make the occurrence of the effect necessary. It is in this sense that $[\lambda x\ \exists y\ (y = x), \Omega]$ causes *m* without preventing *m* from being contingent. Considered now (**CP**) from the perspective of a non-reductivist conception of causality, it is not credible either. If *m* is caused by $[\lambda x\ \exists y\ (y = x), \Omega]$ in a world *w*, then *m* is ontologically dependent on $[\lambda x\ \exists y\ (y = x), \Omega]$. It is constitutive of the essence of *m* –however it is understood– the efficiency of

$[\lambda x\, \exists y\, (y = x), \Omega]$. Therefore, at every possible world in which *m* exists, $[\lambda x\, \exists y\, (y = x), \Omega]$ must be its cause, even though $[\lambda x\, \exists y\, (y = x), \Omega]$ does not cause *m* at all possible worlds. It can be seen, then, that it is not possible from this perspective of causality that $[\lambda x\, \exists y\, (y = x), \Omega]$ and *m* exist, but that $[\lambda x\, \exists y\, (y = x), \Omega]$ does not cause *m*.

It has been possible to appreciate here, then, that for the modal ontological argument and the Scotist argument, the premise of metaphysical possibility is its weak point, since –as has been indicated– the modal intuitions that seem to justify it also seem sufficient for theses of 'reverse' possibility that undermine their reliability and, with it, the reliability of those arguments. One might suppose that the modal-causal argument presented here should have the same weakness, but an examination of (**PP**) and (**CP**) shows that this is not the case. They are, first of all, propositions that are coherent with each other. The introduction of (**CP**) generates a problem –if it generates one– for what has been called the 'part II' of the argument. It has been shown, however, that there are independent problems for (**CP**). It is not plausible neither from a reductive perspective nor from a non-reductive perspective of causality. The discussion that has been made here of the independent (non)reasonableness of (**CP**) is far from exhaustive, but it can be appreciated that the threat of 'inverse' possibility scenarios is not a severe problem for the modal-causal argument.

§ 5. **Conclusions**

A modal-causal argument has been presented in this work to justify the existence of at least one necessary concrete object. This argument depends on a premise of metaphysical possibility (**PP**), according to which it is possible that the mereological fusion of contingent states of affairs, *m*, has a cause. But whatever it is a cause of *m* must be a necessary state of affairs, as stated in the premise of necessity (**NP**). This state of affairs must include at least some concrete necessary object if it is a cause of *m*. This argument depends on an S5 modal logic in which what is possibly necessary is necessary. It has been shown why it is reasonable to assume an S5 logic regarding metaphysical modality.

In other argumentations, such as the modal ontological argument or Duns Scotus' argument in the *Tractatus of primo principio* arises the problem that as plausible as the possibility premise of these arguments is the postulation of an 'inverse' possibility. For the modal ontological argument, it is postulated that it is possible that Ω exists, but it also seems equally reasonable to postulate that it is possible that Ω does not exist. The Scotist argument postulates that it is possible that a necessarily uncaused entity exists, but it seems equally reasonable to postulate the possibility that a necessarily uncaused entity does not exist. The problem that arises in these cases is that the inverse possibilities are incompatible with the initial possibility premises, which makes them less reliable.

In this modal-causal argument, the question also arises about an 'inverse' possibility to that stated in (**PP**), that is, that it is possible that *m* does not have a cause. A closer examination of the question shows that this reverse possibility (**CP**) does not bring the problems that arise for the modal ontological argument and the Scotist argument. First, (**CP**) is consistent with (**PP**). The premise of possibility (**PP**) is consistent with both (**CP**) and its contradictory, that is that it is necessary that *m* has a cause. It also happens that both under reductivist and non-reductivist conceptions of causality (**CP**) seems independently false. The difficulties that the 'inverse' possibility enunciated by (**CP**) may generate are, then, much less serious than for other more traditional forms of argumentation.

Therefore, the modal-causal argument presented here asks for rather weaker premises than those that have usually been appealed to in different forms of cosmological argument. This brings it closer to forms of ontological argument. Contrary to these arguments, however, it is not affected by the problems generated by reliability defects for the modal intuitions on which they rest[19].

Appendix

Derivation of (8) from (**PP**) and (**NP**):

1 $\Diamond\exists x$ (x causes m)
(**PP**)

2 $\Box\forall x$ ((x causes m) $\rightarrow$ ♠x)
(**NP**)

3 $\exists x$ (x causes m)
Out$\Diamond$1

4 $\forall x$ ((x causes m) $\rightarrow$ ♠x)
Out$\Box$2

---

[19] Preliminary versions of this work have been presented at audiences at the Logic and Theism Group (Pontificia Universidad Católica de Chile), Universidad Austral (Buenos Aires) and the LATAM Bridges in Epistemology of Religion Workshop. I thank all those attending in those occasions for their useful commentaries.

5 x cause m
Out∃3

6 (x causes m) → ♠x
Out∀4

7 ♠x
MP 5, 6

8 ∃x ♠x
In∃7

9 ◇∃x ♠x
In◇3

Derivation of (**NP**) from the definition of m and thesis (7):

1 □∀x∀y ((x causes y) → (x | y))
(7)
2 m $=_{\text{df}}$ (xι) ∀y ((y¡x) ↔ ∃z (♣z ∧ (y¡z))) Definition of m
3 □∀x ((x causes m) → (x | m)
Out∀1
4 □∀y ((y○m) ↔ ∃z (♣z ∧ (y○z)))
Def.2
5 □∀y (∃z (♣z ∧(y○z)) → (y○m))
PC4
6 □∀y (¬(y○m) → ¬∃z (♣z ∧ (y○z)))
Contraposition 5
7 □∀x ((x | m) → ¬∃z (♣z ∧ (x○z)))
Definitionof ○

8 $\Box\forall x\,((x \text{ causes } m) \rightarrow \neg\exists z\,(\clubsuit z \wedge (x \bigcirc z)))$
Syllogism7, 3

9 $\Box\forall x\,((x \text{ causes } m) \rightarrow \forall z\,((x \bigcirc z) \rightarrow \spadesuit z))$
PC 8

10 $\Box\forall x\,((x \text{ causes } m) \rightarrow ((x \bigcirc x) \rightarrow \spadesuit x))$
Out∀9

11 $\Box\forall x\,(x \bigcirc x)$
Mereology

12 $\Box\forall x\,((x \text{ causes } m) \rightarrow \spadesuit x)$
MP11,10

Lemma: derivation of the consequent of strict implication (9) from the consequent of strict implication (8) above:

1 $\neg\exists z\,(\clubsuit z \wedge (x \bigcirc z))$ Consequent of (8) above

2 $\forall z\,\neg(\clubsuit z \wedge (x \bigcirc z)$
Interdefinitionof ∀/∃1

3 $\forall z\,(\neg\clubsuit z \vee \neg(x \bigcirc z))$
DeMorgan 2

4 $\forall z\,(\spadesuit z \vee \neg(x \bigcirc z))$
Def. ♠3

5 $\forall z\,(\neg(x \bigcirc z) \vee \spadesuit z)$
Commutativity ∨4

6 $\forall z\,((x \bigcirc z) \rightarrow \spadesuit z)$
Def. →5

References

Aristóteles, *Metafísica*. Introduction, translation and commentary by Tomás Calvo. Madrid: Gredos, 1994.

John Carroll (2009), "Anti-Reductionism" in Helen Beebee, Christopher Hitchcock and Peter Menzies (eds.), *The Oxford Handbook of Causation*, Oxford: Oxford University Press, 279-298.

Nino B. Cocchiarella and Max A. Freund (2008), *Modal Logic. An Introduction to its Syntax and Semantics*, New York: Oxford University Press.

James E. Dolezal (2011), *God Without Parts. Divine Simplicity and the Metaphysics of God's Absoluteness*, Eugene, Oregon: Pickwick.

Blessed Iohannes Duns Scotus, *Obras del doctor sutil Juan Duns Scoto*. Introduction, translation and commentary by Félix Alluntis OFM Madrid: Biblioteca de Autores Cristianos, 1960.

Richard Gale and Alexander R. Pruss (1999), "A New Cosmological Argument", *Religious Studies* 35: 461-476.

G. E. Hughes and M. J. Cresswell (1996), *A New Introduction to Modal Logic*, London: Routledge.

Jaegwon Kim (1976), "Events as Property Exemplifications" in Myles Brand and Douglas Walton (ed.), *Action Theory*, Dordrecht: Reidel, 159-177. Reprinted in *Supervenience and Mind. Selected Philosophical Essays*, Cambridge: Cambridge University Press, 1993, 33-52.

Robert C. Koons (1997), "A New Look at the Cosmological Argument," *American Philosophical Quarterly* 34: 193-212.

Brian Leftow (2012), *God and Necessity*, Oxford: Oxford University Press.

David Lewis (1973a), *Counterfactuals*, Oxford: Blackwell.

David Lewis (1973b), "Causation", *The Journal of Philosophy* 70: 556-567. Reprinted with *Postscripts* in *Philosophical Papers* Volume II. New York: Oxford University Press, 1986, 159-213.

Timothy O'Connor (2008), *Theism and Ultimate Explanation. The Necessary Shape of Contingency*, Oxford: Blackwell.

Graham Oppy (2006), *Arguing About Gods*, Cambridge: Cambridge University Press.

Ted Poston (2018), "The Argument from So Many Arguments" in Walls & Dougherty (2018), 372-386.

Alexander R. Pruss (2006), *The Principle of Sufficient Reason. A Reassessment*, Cambridge: Cambridge University Press.

Alexander R. Pruss (2011), *Actuality, Possibility, and Worlds*, New York: Continuum.

Alexander R. Pruss and Joshua L. Rasmussen (2018), *Necessary Existence*, Oxford: Oxford University Press.

Joshua Rasmussen (2010), "From States of Affairs to a Necessary Being", *Philosophical Studies* 148: 183-187.

Joshua Rasmussen (2011), "A New Argument for a Necessary Being", *Australasian Journal of Philosophy* 89: 351-356.

William L. Rowe (1998), *The Cosmological Argument*, New York: Fordham University Press.

Peter Simons (1987), *Parts. A Study in Ontology*, Oxford: Clarendon Press.

Jordan Howard Sobel (2004), *Logic and Theism. Arguments for and Against Beliefs in God*, Cambridge: Cambridge University Press.

Saint Thomas Aquinas, *Summa theologiae* . Cura et studio Petri Caramello cum textu ex recensione leonina. Rome: Marietti, 1952.

Jerry L. Walls & Trent Dougherty (eds.) (2018), *Two Dozen (or So) Arguments for God. The Plantinga Project*, Oxford: Oxford University Press.