

The Limits of Causality

Louis Caruana SJ

Pontifical Gregorian University, Rome
caruana@unigre.it

Abstract

For decades, much literature on causality has focused on causal processes and causal reasoning in the natural sciences. According to a relatively new trend however, such research on causality remains insufficient because of its refusal to accept a certain degree of pluralism within the concept, a pluralism that is evident in how we use ideas of cause and effect in everyday life. I will build on work in this latter trend, following philosophers like G. E. M. Anscombe and N. Cartwright. I explore the limits of the concept of causality by determining the extent to which our ideas can remain consistent as we stretch this concept along two dimensions, one concerning the maximizing of the effect and the other the maximizing of explanatory depth. Dealing with the cause of the universe, such an investigation touches upon some issues in current empirical cosmology and revisits some classic arguments regarding philosophy of religion and the Platonic notion of participation. The results indicate that the use of current conceptual, logical and analytic tools can deliver new insights that are useful especially for those interested in how causality in the natural sciences links with causality in everyday life.

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In current research on causality there are various trends. The two main ones are probably the one that links causality strictly to empirical science and the one that explores how causality ranges all the way from science to everyday linguistic behavior and practice.¹ Typical of the

¹ We use 'causality' rather than 'causation' when we want to focus on the specific relation between two objects or events, when we want to focus on the specific relation we describe as causal. 'Causality' is derived from the adjective 'causal'. The pair causal-causality is analogous to brutal-brutality, cordial-cordiality, mortal-mortality. We use 'causation' when we want to focus on the action of the causer. Causation is the act of causing just as vibration is the act of vibrating, filtration is the act of filtering, etc. 'Causation' is derived from the verb.

former approach, we have Judea Pearl's *Causality: Models, Reasoning and Inference*; typical of the latter, we have the causal pluralism defended by G.E.M. Anscombe and Nancy Cartwright and the dispositionalism of Stephen Mumford and Rani Lill Anjum.² I am convinced that causal pluralism is a very significant recent development because the conceptual content of causality is not exhausted by what happens in the sciences.³ In what follows, I will be situating the discussion within the latter approach. I will be examining how causality is linked to everyday contexts of explanation and how the idea of limit, referring also to everyday situations, can be applicable to causality. Like Wittgenstein, I am convinced that concepts have habitats; there are places or contexts where they live properly. There are prototypical situations where the concept obtains its primordial meaning, on which various nuances are constructed later. To explore the limits of a concept, we stretch the concept away from its normal habitat to see whether it breaks down and, if it does, where. Following the later Wittgenstein, I am convinced that this operation helps us gain clarity and discover a wider world.⁴ Of course, for the idea of a limit to be applicable we need some variables that can be increased to some maximum or to infinity. As regards causality, two possible ways of studying such conceptual effects are the following.

- (1) C causes E, where E is a specific event or state of affairs; we let E tend to a maximum and explore the causal relation when E becomes the entire universe.
- (2) Grades of causality: C causes E partially or fully (in the sense of C shifting from being a partial explanation of E to being a full explanation of E).

We will see that the exploration of the limits of causality in this sense will resonate with various debates typical of natural theology and with issues discussed and quantified in empirical cosmology. I fully respect the advances that people have made in these areas and I do not intend to discredit their achievements in any way. I think however that we can make a modest contribution by adopting a method that is definitely philosophical, a method that is essentially related to conceptual analysis. My hope is that through my use of current conceptual, logical

² G. E. M. Anscombe, 'Causality and Determination,' in *Causation*, ed. E. Sosa and M. Tooley (Oxford: Oxford University Press, 1993), 88-104; Nancy Cartwright, *Hunting Causes and Using Them: Approaches in Philosophy and Economics* (Cambridge: Cambridge University Press, 2007); Stephen Mumford and Rani Lill Anjum, *Getting Causes from Powers* (Oxford University Press, 2011).

³ On causal pluralism see the 2006 issue of *Philosophica*, which is volume 77. See also Francis Longworth, 'Cartwright's Causal Pluralism: a Critique and an Alternative,' *Analysis Reviews* 70, no. 2 (2010): 310-318, doi:10.1093/analys/anp109. Causal pluralism is neither causal relativism nor causal social constructivism.

⁴ Wittgenstein's early work contains the famous claim, 'The limits of the language (the language that I understand) mean the limits of *my* world' (*Tractatus Logico-Philosophicus*, trans. C. K. Ogden [London: Routledge, 1995], para. 5.62, page 151, italics in the original). In his later work however, he recognized the intricacy of the dependence of meaning on practice. Limits of a language game correspond to limits of a practice.

and analytic tools, the results of this investigation will deliver some new insights, useful for both natural theology and empirical cosmology. Let me add however that, even in this strictly philosophical approach, I am presenting my proposal as just one possible road to take. There may be others.

1. Maximizing E

The first way of exploring the limits of causality, as I said, is to let E tend to a maximum. This maximum we usually refer to by the term ‘the universe’. Is talking about the universe, however, logically consistent?

A lot of scientific effort has been dedicated, especially during these last decades, to questions about the universe. What I will contribute in the following paragraphs is not empirical in nature but conceptual. It will not constitute a test as regards empirical theories. It will seek rather to manifest some of the hidden conceptual rules that determine the correct use of the word ‘universe.’ What follows therefore will be a supplement, not a substitute, for empirical theories in the area of cosmology. We can start with the commonly held assumption that the universe is the sum of all things. This assumption is related to the word’s etymology. In Latin, *unus* means one, and *versum* means to turn. *Universus* therefore corresponds to the notion of a multiplicity turned into one, a multiplicity acting as one whole. Now we need to explore whether this everyday understanding is philosophically sound. To explore the alleged cause of the universe, we should therefore start by making sure that some fundamental possible objections regarding the very idea of ‘universe’ are blocked.⁵

A first objection could arise as regards the very conceivability of what we want to refer to by the word ‘universe.’ We often assume that the universe is conceivable like any other object. We think of objects after detaching them from ourselves, as it were. This way, we picture them as if we are seeing them from a distance. We do this even when we think of astronomical entities of enormous dimensions. Consider for instance the solar system. We think of the solar system and draw diagrams of it, as if we were detached from it. We describe it as it would appear had we been situated at a distance, for instance, in a spaceship. We assume the same counterfactual situation when thinking about even larger astronomical entities. We say for instance, ‘This is a diagram of the galaxy, as we would see it had we been situated at a

⁵ For a comprehensive study of this area see Paul Clavier, *Le concept de monde* (Paris: Presses universitaires de France, 2000).

distance.’ This mental attitude is present also when we try to imagine the entire universe. Following the sequence of increasingly larger objects, we end up imagining the entire universe as an entity perceivable from a point outside it. At this limit, however, the counterfactual situation cannot sustain us any longer. It breaks down because, if the universe is, by definition, the totality of all things, there is nothing outside it, there is no point outside it from which it could be viewed and there is nothing with which it could be contrasted. There is no background against which the idea can stand out. These considerations seem to indicate that there is no referent for the word ‘universe’. In his discussion on this point, Bertrand Russell once observed that the word ‘universe’, even though it is used by many people in various situations, does not necessarily have a proper meaning. He explained this point by saying that ‘the word “universe” is a handy word in some connections, but I don’t think it stands for anything that has a meaning.’⁶ He seemed to imply that the word plays a role within language but does not point to any object in particular. If he is right, the word ‘universe’ is a non-referring term like the words ‘the’ and ‘if.’

There is a second possible objection. This arises from the grammar associated with the correct use of the word ‘universe’. We often assume that we should use ‘universe’ as a count noun, just as we do with words like ‘book.’ This assumption has some important implications. The rules governing our use of ‘book’ allow us to see an individual book as one of a kind, making it possible for us to count a number of books. If we use the same background rules for ‘universe’, we would be assuming the same possibilities. We would be assuming, in the very use of the word, that the universe is one of a kind, and that we could count universes. This affirmation, however, may be a conceptual mistake. Such mistakes happen when we get carried away by the similarity between linguistic grammatical structures that are similar only at the surface. The word ‘universe’ in fact could be another type of noun. It could be a non-count noun like ‘gold.’ If that were the case, the use of the indefinite article would be inappropriate. Just as we cannot say ‘a gold,’ so also, on this view, we cannot say ‘a universe.’ We do say sometimes ‘the gold’ but we do so only in the sense of ‘an instance, or a sample, of gold’ (as in the expression ‘the gold present in this ornament’). Similarly, we could say ‘the universe’ but only in the sense of ‘an instance of universe’ or ‘an instance of reality’ (as in the expression ‘the reality of this galaxy here’). If we adopt this line of reasoning, ‘universe’ will be seen to be very similar to ‘reality’ or ‘nature’ when these terms are used as non-count nouns.

⁶ Bertrand Russell, ‘The Existence of God: a debate between Bertrand Russell and Father F. C. Copleston, S. J.,’ in B. Russell, *Why I am not a Christian: and other essays on religion and related subjects*, ed. P. Edwards (London: Routledge, 2004), 150.

These objections indicate the need for further analysis but do not hinder in any serious way our use of the word ‘universe’ in everyday talk, philosophical speculation, or empirical theorizing. We are indeed successful in the way we use the word ‘universe’ and this point indicates that precision in definition and in grammatical rules are not a necessary condition for the correct use of this word. With this in mind, we can try to retrieve some lessons that the objections teach us. The first objection reminds us that the way we think of something always involves a specific viewpoint. The objection is weak because it depends heavily on a limited theory of meaning. Russell’s claim makes sense only within the restrictions of a referential theory of meaning, according to which a word has meaning if and only if it refers to some object. Many philosophers after Russell however have shown how referential theories of meaning are seriously deficient. The basic point is that a word, even when it is not associated with any physical object, can still be perfectly meaningful. Indeed, words that do not refer can have a meaning that is more crucial in a given context than words that do refer.⁷ The conclusion to draw from this as regards the word ‘universe’ should now be clear. We may not be able to determine the identity conditions of the universe as one object but this does not entail that the word ‘universe’ is somehow semantically wanting. This is a useful lesson we can learn from this first objection. If we move on now to the second, we can recognize some significant implications regarding the plural of the word ‘universe’. If ‘universe’ is a non-count noun, some doubts arise on whether the much-discussed conjecture of there being multiple universes in existence makes sense. Some more attention here is needed.

The so-called many-worlds interpretation of quantum mechanics proposes that, when we perform a quantum experiment with different possible results, all the outcomes become real; they all happen, each in a different world or universe. We are conscious of one of these worlds only. In fact however, there is a constant ramification of reality into different universes, each having equal ontological status. We can call these universes alternative histories. Each possible future constitutes a universe that runs parallel to the one we are conscious of, and each possible future is just as real as the actual universe.⁸ This proposal raises many serious difficulties, some scientific, others conceptual. Let us consider the two main conceptual ones. First, if all parallel universes enjoyed the same ontological status, I would not have to worry about dying. I will

⁷ What Russell calls ‘being handy’ has been recognized as the major backbone of linguistic meaning. More on this will take us into the realm of philosophy of language. I explore this point at length in Louis Caruana, *Nature: its conceptual architecture* (Bern: Peter Lang, 2014).

⁸ This was first proposed by Hugh Everett in 1957. Detailed discussion on the various issues involved, including the original papers, are found in B. De Witt and N. Graham eds., *The Many-Worlds Interpretation of Quantum Mechanics* (Princeton [NJ]: Princeton University Press, 1973).

die in one of these universes but it would be enough for me to know that I will be alive in some other parallel universe. Consider a simple quantum experiment in which the clicking of a Geiger counter detecting nuclear radiation determines whether I will be alive or dead in the near future. In such an experiment, I should not worry because, if the many-worlds interpretation is correct, there will always be a world in which I will be alive. This conceptual experiment exposes the problem. The many-world interpretation is inconsistent with the way we understand rational decision-making and everyday responsible living. When we accept the hypothesis, we apparently solve some local problems at one end of our conceptual scheme while at the same time we destabilize our conceptual scheme completely at another end. Accepting the hypothesis wreaks havoc in the area of decision-making and morals.

The second conceptual problem with the idea of multiple universes arises because, whatever the nature and quantity of these multiple universes, we would always be able to put them into one set. How would we refer to the totality that includes all of them? Having different entities, even very large astronomical ones, does not hinder us from having the concept of universe; this concept has indeed the role of referring to the totality that includes all such entities. Consider now not the many-world proposal associated with the collapse of the wave function within quantum mechanics but the other similar but slightly different idea that cosmologists propose. Here again we meet the idea of ‘universe’ as a count noun. They hold that there are cosmic regions that differ so drastically from each other that we should think of them as different universes. In inflationary cosmology, these different regions of spacetime are relatively self-contained, each with its own laws of physics, its own set of elementary particles, and its own basic geometry. The difference between these regions is so fundamental that some cosmologists do not hesitate to call them different universes.⁹ Even in this case however, we still need a term to refer to the totality, the totality of which each parallel universe would be a part. We need to use some word to denote the conjunction of all universes. In fact, even in this introductory explanation so far, we had to use a word for this conjunction, namely the word ‘totality.’ We cannot avoid this. Notice however that this term ‘totality’ has the exact role that the term ‘universe’ was meant to have before it started getting misused by protagonists of hypotheses involving multiple universes. In brief therefore, introducing the term ‘universes’ in the plural has obliged cosmologists to invent another term to refer to all the universes taken

⁹ It should be clear that the idea of parallel universes, as discussed in quantum mechanics, is not the same as the idea of a multiverse, which is used in inflationary cosmology. The possible correlation between these two ideas is the subject of current research following Juan Maldacena’s work on the so-called anti-de Sitter/conformal field theory correspondence. I thank Sarah Jones Nelson for pointing this out to me.

together. This new term is ‘multiverse’. Clearly, this linguistic circle has landed us at the same place where we had started. It makes more sense to stick to the original meaning of the word ‘universe’ and to designate its various parts by appropriate adjectives.

We can also consider the option of many universes that are not simultaneous. We could have perhaps universes succeeding one another, one disappearing as it gives birth to the next one. This way, the many universes are like a chain with rings that differ from each other. Some universes could have the right conditions for the evolution of living things, others not. The universe we live in is one ring in the chain that happens to have the right conditions for intelligent life to evolve. Of course, all those universes that do not satisfy these conditions do not generate any living thing that is capable of understanding them. In this scenario of a sequence of universes, we assume that the flow of time represents a common background for all universes. This backdrop against which the sequence is conceivable is a conceptual requirement couched within the very idea of having one universe existing *before* or *after* the other. Does this option of a sequence of universes fare any better than the previous version of parallel universes? The answer is no. The argument we used before is also decisive here. To ensure clear and correct reasoning, we need to retain the term ‘universe’ to refer to the totality of all that exists: in this case, to the entire chain. If the sequential hypothesis turns out to be defensible on empirical grounds, the correct way of talking about the situation would be to admit that what we used to consider the entire universe is merely one link in a long chain. The term ‘universe’ would retain its fundamental meaning as the totality and we would not talk about the birth and death of universes but about the birth and death of the various stages of the one universe.

The various arguments in the preceding paragraphs indicate clearly that there is something seriously problematic with the idea of universes in the plural. The original idea, therefore, of the universe being one, understood as the totality of all things, gains support. Its plausibility increases further if we consider in some more detail its linguistic role. Some philosophers have argued convincingly that, in the order of understanding, the universe has to be one by logical necessity; in other words, it must be one because the intellect is one. For instance, Immanuel Kant held that an element of overall unity is one of the conditions of possibility for rationality:

By an architectonic I understand the art of constructing systems. As systematic unity is what first raises ordinary knowledge to the rank of science, that is, makes a system out of a mere aggregate of knowledge, architectonic is the doctrine of the scientific in our knowledge, and therefore necessarily forms part of the doctrine of method. In accordance with reason’s legislative prescriptions, our diverse modes of knowledge must not be

permitted to be a mere rhapsody, but must form a system. Only so can they further the essential ends of reason.¹⁰

Understanding requires not only the evasion of self-contradiction but also the unity of order. When we assume that the universe is understandable, we are in fact holding that it is accessible to our intelligence through the regular systematic relationships between its parts, through connections often expressed as a complex network of internal causal links. Ancient philosophers used to distinguish between cosmos and chaos precisely to emphasize this feature of our world. They were aware that the very idea of understandability carries within it the idea of unity. Nowadays, we express the same point by saying that the correct use of the word ‘universe’ includes unity and that this use manifests a conceptual truth, a rule that needs to be in place prior to empirical observation. No separation, spatial or temporal, between the parts of the universe is drastic enough to justify the misuse of the term universe. Such separations can indeed exist but in that case they should be described in terms of parts, spatial or temporal.¹¹

Up to now we have been exploring the challenges that arise when we let the second *relatum* of the causal relation, in other words the effect, tend to a maximum. We have not considered the cause yet. The results show that this kind of limit, this kind of maximizing, which concerns the effect, leads neither to a contradiction nor to a plurality but rather to a unity, which we indicate by the word ‘universe’. Now we move on to the second kind of limit, the one concerning grades of causality.

2. Maximizing the grade of causality

The idea of grades of causality involves taking ‘cause’ in the original sense to mean something similar to an explanation.¹² The basic hypothesis is that, for any specific

¹⁰ Immanuel Kant, *Critique of Pure Reason*, trans. N. K. Smith (London: Macmillan; New York: St. Martin’s Press, 1929), A832 B860, page 653.

¹¹ Note that some variants of the argument in this paragraph are possible. For instance, St. Thomas Aquinas argued that, since God is one, the world must be one: ‘The very order within things created by God manifests the unity of the universe. For this universe is called one by the unity of order, according to which some things are ordered to others. But whatever things come from God, have the relation of order to each other, and to God Himself.’ (Ipse ordo in rebus sic a Deo creatis existens, unitatem mundi manifestat. Mundus enim iste unus dicitur unitate ordinis, secundum quod quaedam ad alia ordinantur. Quaecumque autem sunt a Deo, ordinem habent ad invicem et ad ipsum Deum). *The Summa Theologica*, trans. the Fathers of the English Dominican Province (Benziger Bros. edition, 1947), I, Q 47, a 3 (my translation).

¹² The Greek ‘aition’ refers both to cause and to explanation. For instance in Plato, to give the ‘cause’ (*aition*) of X is to determine the thing responsible for X, and thereby to assign to that thing the responsibility (*aitia*) for X. We thus *account for* X. This is similar to the way a law court seeks to determine the person responsible for a crime. This original Platonic link between cause and explanation is studied comprehensively in David Sedley, ‘Platonic Causes,’ *Phronesis* 43, no. 2 (1998): 114-132.

phenomenon (and I am not talking about the entire universe only), we can legitimately talk about grades of causality in the sense of the degree of explanation available for that specific phenomenon. In other words, we need to explore the idea of explaining something partially or fully. The limit occurs in the following way. We explore the limit as we move from explaining something to some extent, to a greater extent, to an even greater extent and so on, until we could say that we explain it fully.

The basic idea is not difficult to conceive. Consider the case of a professor wanting to know how much of a student's essay was really the outcome of that student's own efforts. The essay is a case of production, of efficient causality. There are various possible answers to the professor's concerns. At one end of the spectrum we have the case of flagrant plagiarism. The student plagiarized his essay entirely. He downloaded it entirely from the internet. In this case we cannot say that he was the cause of the essay. He does not deserve a mark because he was not the cause. If we want to assign a number to the student's own efforts, related to how much of his causing was involved, we could say that the grade of causality here is zero. The next step could be when the student submits an essay made up like a collage of plagiarized bits and pieces. Here he may be granted some merit – at least for joining up the plagiarized bits into a unified whole. The grade of causality here is somewhat higher than zero. We could consider other scenarios, going up the ladder of grades of causality, by considering the case where the student uses ideas proposed by others but expresses them in his own words, and finally the case where the essay is completely original. In this last case we could talk of the highest grade of causality. I am convinced that the kind of graded causality represented by this example is perfectly valid. It is not in any way a marginal or incorrect way of using the concept of causality. We need to explore now how this simple model of graded causality could be applicable to material objects and states of affairs.

Before we proceed however we need to deal with the following objection. Even though the student's essay example seems plausible, other simple cases of causality do not seem to allow for grades. For instance, we say that the throwing of the stone caused the smashing of the windowpane. In this case, the cause apparently delivers the entire effect. It would be strange to insist that the cause was somewhat limited because it did not cause, say, the existence of the windowpane, or the windowpane's weight per square centimeter, or any other feature of the windowpane. It would be incorrect to say that the throwing of the stone, as a cause, was somewhat deficient because it did not cause all these other features but only the smashing. These considerations suggest that causality within the statement 'C causes E' is always entire. The description of C and E is so determined precisely to ensure this. Of course, there are cases

of partial causality but these are always cases of joint causality. For instance the rainbow is caused by the combination of rain and sunlight. We could say that the sunlight caused the rainbow and that this causality was partial. Without the rain the rainbow would not have occurred. The rain likewise is a partial cause. In such cases, we could perhaps resort to the idea of graded causality in this restricted sense. Notice however that the description of the cause and of the effect makes a difference. We could for instance have referred to the combined event ‘the rain together with the sunlight’, this combination as the cause. This composite event would then have full causality with respect to the effect, the rainbow. The partial nature of causality therefore seems to be a matter of convention.

To respond to this objection we need to notice how the argument is in fact reducing the complexity of the situation to a minimum. Like most empirical work, it deals with ideal cases. It deals with ideal cases where many variables are involved but only a few of them are considered. The complexity of real, non-ideal situations implies however that many unmentioned conditions have to be satisfied for the effect to occur even when the quoted cause occurs. The throwing of the stone indeed causes the smashing of the windowpane but only when the throwing of the stone occurs when the glass is of a certain fragility, when the stone is over a certain weight, when the throw is above a certain force, and when many other such conditions are satisfied. Seen from this perspective, the causality attributed to the throwing of the stone does not appear to be as entire as it appeared before. Admittedly, the idea of graded causality is present here not as in the student’s essay example but in a different way. Here we have causality in the sense of explanation. Causality has grades because the event we call the cause is just one element of a large set of conditions. And to be able to claim that the effect is fully explained, we need to know the entire set.¹³

The overall point therefore could be formulated as follows. The idea of graded causality is defensible in so far as causality is considered in the broad sense of explanation.

3. The cause of the universe

We are now in a position to deal with the question of the cause of the universe. Our aim is to explore the extent to which it is possible to talk about the full cause of the entire universe. In this way we are using the idea of limits on two fronts: the limit as the *explanandum* goes to

¹³ I am arguing against reductive approaches within the philosophy of explanation, exemplified by David-Hillel Ruben, *Explaining Explanation* (Routledge, 1990).

its maximum together with the limit as the explanation goes from partial to full. Of course, philosophical inquiry about the cause of the universe is not something new. The line we are following here, because of its emphasis on full or partial explanation, corresponds more or less to what in philosophy of religion is called the contingency argument for the existence of God, which was explored carefully by major figures like Aquinas and Leibniz.¹⁴

I will first present the main argument, which involves the idea of contingency, and then briefly deal with two possible objections.

In logic, contingency is an attribute of propositions. A proposition can be true in all possible worlds. In this case we say that it is necessary. If it is not necessary, then it is contingent. We can draw this same distinction between propositions by using the idea of explanation. A necessary proposition is one that needs no further explanation. It is self-explanatory. A contingent proposition is one that is explainable with reference to other information, other facts, beyond what it contains. Contingent propositions describe states of affairs that could have been different from what they actually are. For example, if a leaf falls off from a branch of a tree and lands two meters away from the trunk, the proposition describing it is contingent because the leaf could have landed not two meters away but one meter away. What determines the truth as regards the final position of the leaf involves many variables. It depends on the leaf's shape, the wind direction, the ground's features, and so on. The final position of the leaf with respect to the trunk could have been different. This is what makes this particular state of affairs not self-explanatory. To explain it, to determine what causality is involved, we need to refer to prior or wider circumstances.

Up to now, there has been nothing special in the discussion. The crucial move comes when we try to apply these distinctions to the case of the entire universe. We take the universe to be the conjunction of all things that exist, all that existed, and all that will exist. That all these things exist, existed, or will exist constitutes a fact. Is this comprehensive, maximal fact necessary or contingent? We are here exploring the limits of explanation and therefore of causality. The way to proceed is to recall that the universe as a whole certainly includes some contingent facts. For instance, the actual universe is the one in which the leaf has fallen two meters away from the trunk. This actual universe however could have been different because it could have been a universe in which the leaf falls only one meter away from the trunk.

¹⁴ Thomas Aquinas, *Summa Theologica*, I, Q 2, a 3; G. W. Leibniz, *Monadology*, trans. N. Rescher (Pittsburgh, PA: University of Pittsburg Press, 1991), paragraphs 31-40.

The universe as a whole therefore is contingent. In other words. It is not self-explanatory. It needs an explanation. This explanation needs to be a necessary one so as to close the chain of contingent explanations. If there were no such self-explanatory fact, or ultimate cause, the universe as a whole would remain ultimately unintelligible. It could be locally intelligible in the sense of having partial explanations available; but it would be ultimately unintelligible. Causality could cover local facts such as the falling of the leaf. It could cover more general facts like the laws on which these local casual explanations depend. It would however never be complete. If there were no ultimate cause, if there were no self-explanatory cause of the whole universe, the search for completeness of our explanation would be pushed further and further back without hope of resolution. We need the explanatory chain to be hanging from some stable support, from a necessary ultimate cause. Otherwise the incompleteness in our intelligibility would trickle down the chain. It would infest with incompleteness all explanations, even local ones. It renders incomplete even the explanation of the leaf falling here rather than there. To ensure the full intelligibility of the universe therefore there must be a necessary fact that explains the universe.

There are some objections that could be brought against this kind of argument. I will consider two major ones that are especially worthy of mention. The first one deals with the fallacy of composition and the second one with infinite regress.

Does the argument above commit the fallacy of composition? It apparently does. Let us recall that to commit this kind of fallacy we start from the fact that every part of a whole has a certain property, and then deduce that the whole has that property as well. For instance, we notice that every brick in the wall weighs less than ten kilograms, and then deduce that the wall itself therefore weighs less than ten kilograms. Such reasoning is obviously mistaken. The argument I presented above could suffer from the same problem. An opponent could argue that we are reasoning in the same mistaken way because we are affirming that, since every part of the universe is contingent, the universe as a whole is contingent. This however does not necessarily follow.

Is this objection valid? The overall point of the fallacy of composition is to manifest the error we commit when we assume that the inference from part to whole is *always* correct. The point is not that all kinds of inference from part to whole are incorrect. In fact, a lot depends on the kind of property we are considering. Properties of the parts come in various types. There are properties of parts that are also properties of the whole and properties of parts that are not properties of the whole. In the example above, the weight of each brick is obviously a property that does not apply to the whole wall. There are however other properties of the each brick that

are indeed properties of the wall itself. For instance, if we have the property ‘is underwater’ as a property of each part, then it would be perfectly legitimate to conclude that such a property is a property also of the whole of which each brick forms a part. In other words, it is not a fallacy to infer from the fact that each brick is underwater that the entire wall is underwater. So the fallacy of composition occurs with some properties but not with all. Moreover, there are other kinds of properties that pass on to the whole even if not all the parts have them. Consider for instance the property ‘contains nuclear material.’ If some bricks contain nuclear material, the entire wall contains nuclear material.

The argument I presented above is not inferring a property of the whole from a property that is possessed by *all* of its parts. It is inferring a property of the whole from a property of *some* of its parts. It is saying that the universe is contingent because *some* of its parts are contingent. Before condemning this reasoning as a fallacy of composition, therefore, we need to examine carefully the nature of the particular property involved. The main question becomes: ‘Is being contingent like being less than ten kilograms in weight, or like being underwater, or like containing nuclear material?’ Clearly, all that the contingency argument needs is that being contingent is like the latter. It is not difficult to see that this is indeed the case. Contingency is like the weakness of one ring in a chain. If one ring is weak, the entire chain will be weak. It will be weak even if all the other rings are strong. The weakness present in one of the rings is transmitted to the entire chain. It becomes the property of the entire chain. Likewise, if one part of the universe is contingent, the whole universe is contingent, even if all other parts are necessary. We observe here that necessity and contingency are not balanced opposites. For the whole to be contingent, one contingent part suffices; but for the whole to be necessary, all parts must be necessary. This is the basic insight on which the contingency argument depends. The charge of fallacious reasoning is not well founded.

The second possible weakness of the argument refers to infinite regress. If we accept the ultimate explanation or the limit cause, we apparently need to face the question ‘What is the cause of the limit cause?’ The assumption that the causal sequence is in some sense convergent, that the limit exists, seems inherently unstable. It reminds us of the well-known question in children’s religion class: ‘Who made God?’ When children ask this question, they are showing that their idea of God is too anthropomorphic — which is to be expected from children. They assume that there is similarity between God and human beings, and, if the existence of humans calls for a cause, so does the existence of God. David Hume, in his *Dialogues concerning Natural Religion*, deals with this point and highlights the question of degrees of analogy: if we take God, the Creator, as analogous to humans, God must then have a cause just as humans

do.¹⁵ If instead of God we have the ultimate cause, the same kind of reasoning generates the same kind of question. We assume tacitly that the ultimate cause is similar to other causes, and thereby conclude that, if the occurrence of causes allows for an inquiry into their causes, so also the ultimate cause. The problem in both cases lies in the degree of similarity that we assume between the limit concept and those normal concepts that we use to point towards the limit concept. How similar is God to human beings? How similar is the ultimate cause to normal causes? Since, in these considerations, we are dealing with limit concepts, the answer to these questions is not straightforward.

Consider briefly for instance Spinoza's approach to this problem. In his *Ethics*, he first argues that God is the absolutely infinite being and then that God exists necessarily.¹⁶ It follows that God is the only substance and is also the non-transitive, immanent cause of all things.¹⁷ The universe is not therefore a production of God that lies outside of God. It is rather the necessary development of God. To articulate this point Spinoza assumes that the concept of God is continuous with that of nature. *Natura naturans* and *Natura naturata* are like two sides of the same coin. And the coin is necessity. By joining these two concepts together, Spinoza is therefore stipulating that the question 'What is the cause of the laws of nature?' and the question 'What is the cause of the universe?' have no meaning. For him, referring to the laws or to the universe within an explanation is a way of terminating the inquiry; it is an explanation stopper. Everything is in God and God is necessary. According to Spinoza, what I am seeking in this paper through the analysis of the limits of causality, in other words the full explanation of the totality, is available at the level of the laws of nature together with the necessity they include.

Aquinas had argued differently. He had argued that there is a fundamental distinction between *creating* substance and *created* substance. *Deus* is not the same as *Natura*; *Deus* is not continuous with *Natura*. *Deus* is incommensurably different. For Aquinas, it makes perfectly good sense to ask, 'What is the cause of the order of the universe?' God is the one who created all the constituents of the universe, with all their specific and generic dispositions and all the laws that are discernible within the universe, including the contingency therein. For Aquinas, God is like the student in my example above, the student who produced the research paper in its entirety. God is distinct from creation and is also the one who created all of it, laws and all, with both necessity and contingency. Aquinas is articulating the fullest kind of causality, what

¹⁵ See David Hume, *Dialogues concerning Natural Religion* (Middlesex, England: Penguin Books, Ltd, 1990), part XII.

¹⁶ See Benedict De Spinoza, *Ethics proved in geometrical order*, trans. M. Silverthorne and M. J. Kisner (Cambridge: Cambridge University Press, 2018), Definition 6 and First Part, sec.11.

¹⁷ *Ibid.*, First Part, sec. 18.

I called the highest grade of causality. In arguing this way, Aquinas is avoiding the element of necessity that Spinoza, and earlier thinkers like Plotinus, included within creation. This seems a good move, perfectly in line with the Biblical picture. To do this however, Aquinas needs to pay a price. He needs to explain how God as creator could be conceivable outside the universe, which, by definition, contains all there is. To achieve this, Aquinas has no other way than to resort to the idea that the causality of creation is unlike any other form of causality. Creation is not a kind of production but a relation of ontological dependence. Notice how this feature of Aquinas refers back to Plato's views on causality, especially Plato's rejection of causality in terms of material mechanisms and Plato's recourse to participation.¹⁸

My argument in this paper has obviously drawn me closer to Aquinas than to Spinoza. I would like to add however that although the ultimate cause involved in creation is distinct from all other causes, we can still use these other causes as a ladder to arrive at some knowledge of the limit. Can a limit can be radically different from the members of the sequence that lead up to it? The answer is yes. For instance, the limit of the sequence of regular polygons inscribed within a circle, as the number of their sides increases, is the circumference of the circle. But the circumference is a curve while the sides of the polygons are straight lines. The limit is thus *essentially* different from the sequence that leads up to it. There is a way, therefore, of avoiding the infinite regress of the causes of causes. We can resort to the idea that, although the ultimate cause is a limit of caused causes, it is essentially different. All causers have causes while the ultimate cause has none. All explanations are partial, some with a low grade of causality, others with a high grade of causality. The ultimate explanation however is full.

¹⁸ For Aquinas's views see *Summa Theologica*, I, Q 44-47. For Plato's views on causality see Phillip H. Delacy, 'The Problem of Causation in Plato's Philosophy,' *Classical Philology* 34, no. 2 (1939): 97-115. Delacy explains the fundamental incompatibilities between Plato and Aristotle in this area. Plato does not associate causality with motion and change but with the metaphysical relation between abstract universals and concrete particulars. It seems therefore that Aquinas's distinction between primary causality (the act of creation) and secondary causality reflects his adopting Platonic views for the first and Aristotelian views for the second. We can claim this even though Aquinas added to primary causality the important ingredient of divine freedom, which is a Christian idea. In later dialogues, Plato associates causality with the motion initiated by the soul. Soul and life are synonymous; they are self-movers. In this sense, cause is active power. It includes motion and is therefore in conflict with Plato's own previous theory of Ideas, which are immutable. In the later works, Plato attempts a theory of causation based on the soul's agency. There is no non-purposive cause for Plato. For more on the analogous nature of causality, see Piotr Roszak, 'Analogical understanding of divine causality in Thomas Aquinas,' *European Journal for Philosophy of Religion* 9, no. 4 (2017): 133-154, doi: 10.24204/ejpr.v9i4.1789.

Conclusion

My original aim in this paper was to judge the utility of studying the limits of causality. I explored the limits along two dimensions, one concerning the maximizing of the effect and the other the maximizing of explanatory depth. As we saw, such an investigation touches upon some issues in current empirical cosmology and revisits some classic arguments regarding philosophy of religion and the Platonic notion of participation. Many other arguments can be brought in and some of those discussed need further clarification. Overall, however, the results indicate that the use of current conceptual, logical and analytic tools can deliver new interesting insights. We can express the basic question in this way. Does the stretching of the concept of causality to its limits lead to logical contradictions? If my reasoning is correct, the answer is no.

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