

## God, causation and occasionalism

WILLIAM F. VALLICELLA

*1360 East Cindy Street, Chandler, Arizona, 85225-5433*

**Abstract.** The doctrine that there are no logically necessary connections in nature can be used to support both occasionalism, according to which God alone can be a cause, and ‘anti-occasionalism’, according to which God cannot be a cause. Quentin Smith has recently invoked the ‘no logically necessary connections in nature’ doctrine in support of the latter. I bring two main objections against his thesis that God (logically) cannot be a cause. The first is that there are good reasons to think that there are irreducible dispositions in nature, and that where such dispositions are manifested, there are logically necessary causal connections. The second objection is that even if the ‘no logically necessary connections in nature’ doctrine is true, one is not forced to deny causal efficacy to God: with no breach in logical propriety, one may embrace occasionalism.

The doctrine that there are no logically necessary connections in nature has interesting theological implications. Prior to Hume, al-Ghazali and Malebranche used it to support occasionalism, the view that God alone is and can be a genuine cause. But a recent article by Quentin Smith suggests that the ‘no logically necessary connections’ doctrine can also be pressed into the service of what I will call ‘anti-occasionalism’, the view that God cannot be a cause of anything.<sup>1</sup> If the occasionalist view is that God does all the causing, the anti-occasionalist view is that God does none of the causing. In brief, Smith’s surprising thesis is that a correct analysis of natural causation is incompatible with the logical possibility of a divine cause.<sup>2</sup>

I will bring two main objections against Smith’s position, the first strong, the second insurmountable. The first is that there are excellent grounds in the philosophy of physics for positing irreducible dispositions in nature, and that where such dispositions are manifested, there are logically necessary causal connections. As a bonus, I will adduce cases of mereological generation and micro-macro determination which also appear to make trouble for the ‘no logically necessary connections in nature’ doctrine. The second main objection is that, even if there are no logically necessary connections in nature, one is not forced to deny causal efficacy to God. For with no breach of logical propriety, one may simply embrace occasionalism.

<sup>1</sup> Quentin Smith ‘Causation and the logical impossibility of a divine cause’, *Philosophical Topics*, 24 (1996), 169–191. Page numbers in parentheses refer to this article.

<sup>2</sup> And, of course, if there is no logically possible world in which God is a cause, then God as classically conceived does not exist.

## I

## MALEBRANCHE AND ANTI-MALEBRANCHE

Malebranche famously argued that God alone is a genuine cause, and that therefore no natural cause is a genuine cause. Natural ‘causes’ are mere occasions for the exercise of divine causality.<sup>3</sup> Leaving history to the historians, we may impute the following argument to him:

P<sub>1</sub> Being omnipotent, God’s willing  $x$  is logically sufficient for  $x$ ’s occurrence.

P<sub>2</sub> God’s willing  $x$  causes  $x$ ’s occurrence.

Therefore,

C<sub>1</sub> Some causes are logically sufficient for their effects.

P<sub>3</sub> If some causes are logically sufficient for their effects, then all are.

Therefore,

C<sub>2</sub> All causes are logically sufficient for their effects.

P<sub>4</sub> No natural event is logically sufficient for any other.<sup>4</sup>

Therefore,

C<sub>3</sub> No natural event is a cause.

Call this argument ‘Malebranche’. ‘Anti-Malebranche’ is the argument run in reverse. Holding (P<sub>4</sub>), (P<sub>3</sub>) and (P<sub>1</sub>) fixed, ‘anti-Malebranche’ moves from the denial of (C<sub>3</sub>) to the denial of (C<sub>2</sub>), from there to the denial of (C<sub>1</sub>), and finally to the denial of (P<sub>2</sub>). In brief, Malebranche, taking divine willing as the paradigm of all causation, argues via plausible assumptions to the conclusion that there is no causation in nature. ‘Anti-Malebranche’, taking natural causation to be both given and paradigmatic of all causation, argues via the same plausible assumptions to the conclusion that God or God’s acts of will cannot function as causes. The reader may verify that both arguments are valid.

But how plausible are the assumptions? (P<sub>1</sub>) is an analytic truth unlikely to inspire protest. Of course, to be fully presentable it needs a bit of cleaning up: we need to restrict the range of  $x$  to logically possible states of affairs, and perhaps add other refinements. I leave this to the reader. (P<sub>3</sub>) simply records our decision to use ‘cause’ univocally. Since Smith accepts (P<sub>1</sub>) and (P<sub>3</sub>), they need no further defence here.

Given that (P<sub>1</sub>) and (P<sub>3</sub>) are unproblematic, the pivot-point of both arguments is (P<sub>4</sub>), the premise that no natural event is such that its occurrence is logically sufficient for the occurrence of any other natural event where the two events are not narrowly-logically or semantically connected. An individual’s being green is logically sufficient for its being either green or

<sup>3</sup> For a good recent discussion of the historical details, see Steven Nadler ‘“No necessary connection”’: the medieval roots of the occasionalist roots of Hume’, *The Monist*, 79 (1996), 448–466.

<sup>4</sup> To be precise, no two narrowly-logically or semantically distinct natural events are such that one is logically sufficient for the other. This will be explained shortly.

non-green, as well as for its being coloured; but it is clearly not this sort of logically necessary connection between natural events or states that proponents of (P<sub>4</sub>) are concerned to deny. They are out to deny logically necessary connections between narrowly-logically and semantico-conceptually *distinct* natural events or states. So qualified, (P<sub>4</sub>) will strike many as self-evident. No doubt there are natural events so related that one is a *causally* sufficient condition of the other, but surely no such event (subject to the lately made qualification) is *logically* sufficient for any other?

Nevertheless, my first main task will be to argue that there are good reasons to doubt (P<sub>4</sub>), and thus good reasons to doubt the soundness of both ‘Malebranche’ and ‘anti-Malebranche’. But first we need to take a closer look at Smith’s position.

## II

ON THE ALLEGED LOGICAL IMPOSSIBILITY OF A DIVINE CAUSE OF  
THE UNIVERSE

In the article cited, Smith instantiates a role very close to that of ‘anti-Malebranche’. What he argues is that there is no one (univocal) concept of causation that could subsume both the instances of causation in nature and that putative instance of causation which is God’s creation of the universe or else his creation of the initial segment thereof. And so given that there are instances of causation in nature, Smith would have us conclude that it is logically impossible that God (or an act of his will) function as a genuine cause. The central idea, then, is that there (logically) can be no definition of ‘*x* causes *y*’ which is satisfied both by causal event sequences in the natural world, and also by the event sequence consisting of God’s willing the Big Bang, say, followed by the occurrence of the Big Bang. Smith’s idea has some initial plausibility. If, for example, it could be shown that causation necessarily involves the transfer of some physical quantity such as energy or momentum from the cause to the effect along a space-time path, it would follow that no nonphysical being such as God could cause anything. A similar conclusion would follow if spatial contiguity of cause and effect were part of the nature of the causal nexus. Neither God, nor the event of his willing the universe to exist, are in space.

Of course, for the above argument-strategy in support of ‘anti-occasionalism’ to succeed, it would have to be shown that every *actual and possible* theory of natural causation rules out the possibility of a divine cause – that there is no (doxastically) possible theory of natural causation that allows room for divine causation. After surveying nomological, transference, singularist and counterfactual theories of causation, Smith realizes that a run-through of extant theories can at best provide weak inductive support for his conclusion. So he tries to find a feature which the causal relation

possesses, but which God's creating of the universe or its initial segment could not possess. The feature he finds is that the causal relation is never such that the cause is a logically sufficient condition of the effect, whereas God's willing the Big Bang to occur is logically sufficient – in view of the divine omnipotence – for the occurrence of the Big Bang. As Smith puts it, 'For any two particular events or states  $x$  and  $y$ , if  $x$  is a logically sufficient condition of  $y$ , then  $x$  is not a cause of  $y$ ' (176). By contraposition, if  $x$  is a cause of  $y$ , then  $x$  is not a logically sufficient condition of  $y$ . For example, holding a flame to a piece of ordinary dry newspaper (in normal conditions) is a cause but not a logically sufficient condition of the paper's ignition, since there is no contradiction in the supposition that in the presence of flame the paper fail to ignite. But it would be a logical contradiction to suppose that an omnipotent God will the occurrence of  $x$ , but  $x$  not occur. And so Smith invites us to conclude that God's willing of  $x$  cannot be a cause of  $x$ 's occurrence. Smith's argument, then, may be set forth as follows:

Any  $x$  logically sufficient for some  $y$  cannot be a cause of  $y$ .

God's willing  $z$  is logically sufficient for  $z$ 's occurrence.

Therefore,

God's willing  $z$  cannot be a cause of  $z$ 's occurrence.

Several questions suggest themselves; I will focus on two.

(Q1) Are there really no cases of natural causation in which the cause is logically sufficient for the effect?

(Q2) Even if there are no cases in which the cause is logically sufficient for the effect, why cannot the theist grant that God's willing is not a 'cause' of the universe's beginning as Smith defines this term, but nevertheless the creator or producer of the universe's beginning?

### III

#### AD (Q1): PRELIMINARIES

Before we can tackle (Q1), we need to nail down some preliminary points.

(i) I will follow Smith in assuming that the relata of the causal relation are events exclusively, and that an event is an individual's instantiation of a monadic property at a time (or through an interval of time) or an  $n$ -tuple's instantiation of a  $n$ -adic relation at a time (or through an interval of time). On this Kimian view of events, there is no distinction between an event and a state. 'Event' is elliptical for 'token event'.

(ii) Strictly speaking, if one item is *logically* sufficient for a second, then the two are propositions (or cognate items), abstract denizens of the 'logical order'. But events are concrete particulars residing in the 'real order'. Therefore, to ask whether token deterministic cause  $c$  is logically sufficient for its token effect  $e$  is a loose way of asking whether a complete description of

$c$  logically implies a proposition to the effect that  $e$  occurs. This being noted, no harm will come of speaking loosely.

Of course, the description of  $c$  cannot include propositions with terms that denote  $e$ ; otherwise it would be trivially true that  $c$  is logically sufficient for  $e$ . An occurrence of an event described as the blow that knocked Ali out is (trivially) logically sufficient for the occurrence of the event of Ali's knock-out. Nor can the description of  $c$  include any law statements as I explain in the next paragraph. But the description of  $c$ , to be complete, must describe  $c$ 's circumstances. No one, not even the most extreme causal rationalist, would claim that a match striking in and of itself is logically sufficient for a match-ignition; if the cause is sufficient for the effect, it is sufficient only in its circumstances: the match must be dry, struck with sufficient force, in an oxygen-rich atmosphere, etc. To put it another way, if the cause is logically sufficient for the effect, it is only what could be called the *total* cause that is so sufficient.

(iii) It is undeniable that there are cases in which the conjunction of a statement of a deterministic law of nature and a description of an event logically implies a proposition to the effect that a distinct event occurs. Thus the conjunction of 'metals expand when heated' and 'this metal bar is being heated' logically implies 'this metal bar is expanding'. But this cannot be taken to show that the heating of the bar is logically sufficient for its expansion. For minus the law statement, which is logically contingent, the implication does not hold. The issue is whether a sentence (or else a proposition expressed by its tokening) like 'this metal bar is being heated' together with sentences descriptive of the circumstances logically implies 'this metal bar is expanding'. If it does, then the (total) cause is logically sufficient for the effect.

(iv) Although a sufficient condition is not to be confused with a necessary condition, to say that  $c$  is logically sufficient for  $e$  is equivalent to saying that  $c$  logically necessitates  $e$ . For if the occurrence of  $c$  is logically sufficient for the occurrence of  $e$ , then  $e$  (logically) cannot fail to occur given  $c$ 's occurrence; and that amounts to the claim that  $c$  logically necessitates  $e$ . And to say this is to imply that there is a logically necessary connection between  $c$  and  $e$ . If there is such a connection, then causal necessitation will be a species of logical necessitation. One need not go back to Spinoza to find such a view; one finds it in Shoemaker, not to mention other contemporaries.<sup>5</sup>

(v) But did not Hume show once and for all that there cannot be a *logically* necessary connection between cause events and effect events? That depends on the exact import of 'logically necessary connection'. If a connection is logically necessary, it does not follow, *pace* Hume, that it is a priori knowable. It could be a posteriori knowable.<sup>6</sup> At most, what Hume showed is that there

<sup>5</sup> Cf. Sydney Shoemaker 'Causality and properties', in *Identity, Cause and Mind: Philosophical Essays* (Cambridge: Cambridge University Press, 1984), 222. <sup>6</sup> Cf. the reference to Kripke below.

are no a priori knowable logically necessary connections between distinct events. But this does not show that there are no logically necessary connections between distinct events.

Note first that a logically necessary connection cannot be a merely singular connection between two event-tokens; it must be a connection mediated by properties of the events. For if  $e_1$  logically necessitates  $e_2$ , then it is a logical contradiction that  $e_1$  occur but  $e_2$  not occur. But no particular *qua* particular logically contradicts itself or any other particular. So it is only in virtue of its properties that the occurrence of one event could contradict the occurrence of another, or the occurrence of the first could logically necessitate the occurrence of the second. (This is a corollary of remark (ii) *supra*). It follows that ‘ $c$  logically necessitates  $e$ ’ implies ‘Necessarily, every  $c$ -type event brings about an  $e$ -type event’ where the modal operator conveys logical or metaphysical necessity. Granting this, a Humean will be quick to argue from the conceptual possibility of  $c$ -type events without subsequent  $e$ -type events to the falsity of ‘ $c$  logically necessitates  $e$ ’. He will point out that, e.g., although water-freezing has been followed hitherto by water-expansion, there is no contradiction in the supposition that tomorrow a water-freezing will be followed by a water-contraction. Surely it is not analytic that freezing causes expansion; surely this cannot be known a priori.

Now if a logically necessary connection between  $c$  and  $e$  is one that supports an a priori inference from  $c$  to  $e$ , then I think we must grant that Hume did show that in many cases at least, causes do not logically necessitate their effects. For the most part, what causes what can only be learned by experience. In general, one cannot know that every  $c$ -type event must bring about an  $e$ -type event merely by inspecting the properties involved in a  $c$ -type event. I take it that it was this sort of necessary connection that Hume was most concerned to deny.<sup>7</sup> To deny necessary connection in this sense is equivalent to denying that causal laws are analytic or knowable a priori. But a law can be logically or metaphysically necessary without being knowable a priori. Suppose the truth-makers for natural law statements are individuals that essentially possess irreducible active and passive causal powers. If  $x$  possesses power  $P$  in every logically possible world in which  $x$  exists, then whenever  $P$  is activated, the effect will be logically necessitated. Suppose further that the powers individuals possess – e.g. copper’s power to conduct electricity can only be discovered empirically. It will then be the case that law statements are necessarily true without being analytic or knowable a priori. The view that law statements are logically necessary will then be immune to the Humean strictures on acquiring knowledge of matters of fact and real existence by demonstrative (a priori) means; (details follow).

<sup>7</sup> Cf. J. L. Mackie *The Cement of the Universe: A Study of Causation* (Oxford: Oxford University Press, 1980), 11 ff.

## IV

## AD (Q1): EXAMPLES OF DIACHRONIC NECESSITARIAN EVENT-CAUSATION

*(i) An argument from irreducible dispositionality*

We come now to (Q1): are there really no cases in which causes are logically sufficient for their effects? Consider again the dry newspaper. At first glance it may seem that there is no logical contradiction in the supposition that being exposed to flame (in normal circumstances) the newspaper not ignite. But the newspaper has the dispositional property of being inflammable, and if we take dispositions into account it can be plausibly argued that total causes involving dispositional properties logically necessitate their effects. Of course, one cannot take dispositions into account if one does not admit that there are such things. An eliminativist about dispositions might claim that although Socrates is sometimes sitting and sometimes standing, when he is sitting there is no such thing as his unexercised power to stand, and when he is standing no such thing as his unexercised power to sit. This is the old Megarian doctrine rejected by Aristotle. We should reject it as well.<sup>8</sup>

We should also reject phenomenalist or ‘behaviourist’ theories of dispositions. Unlike the eliminativist, the phenomenalist admits that there are dispositions, but denies that they need bases in the things that have them. Roughly, the phenomenalist maintains that the having of a disposition consists merely in the holding of a conditional. To say ‘*a* is brittle’ is just to say ‘If *a* were suitably struck, it would break’; it is not to imply that there is any property possession of which by *a* makes the conditional true. This has the consequence that *a* and *b* could be alike in all causally relevant properties with *a* brittle and *b* non-brittle. This is highly counterintuitive, but it gets worse. Suppose *a* is subjected to processes (e.g., heating and cooling) that cause it to change from brittle to non-brittle and back again. The phenomenalist view implies that these real changes in *a* are not at all relevant to the counterfactual’s holding of *a*. And that seems absurd. So without further ado let us agree that dispositions are real properties of individuals.<sup>9</sup>

But if dispositional properties are real, it doesn’t follow that they are irreducibly real. Perhaps they are identical with, or supervenient upon, categorical (non-dispositional) properties. Perhaps the truth-maker of ‘had I dropped this light bulb, it would have shattered’ is a purely categorical property, or else a categorical property aided and abetted by logically contingent laws of nature.<sup>10</sup> The following argument requires that dis-

<sup>8</sup> Cf. Elizabeth Prior *Dispositions* (Aberdeen: Aberdeen University Press, 1985), 12–14.

<sup>9</sup> Cf. D. H. Mellor ‘In defence of dispositions’, *The Philosophical Review*, **83** (1974), 157–181.

<sup>10</sup> The second disjunct describes David Armstrong’s view. See his *A World of States of Affairs* (Cambridge: Cambridge University Press, 1997), 80–83.

positions be irreducible, an assumption to be defended in section IV(iii.) after the argument is before us.

An irreducible disposition might also be described as a ‘bare’ disposition, one that has no need of a *categorical* basis. A bare disposition might still have a basis, but it would have to be itself dispositional. Indeed, there is reason to think that ‘science finds only dispositional properties, all the way down’.<sup>11</sup>

(ii) *From irreducible dispositions to logically necessary causal connections*

(a) We begin with the plausible premise that some individuals are such that their identities are bound up with their active and passive causal powers. Call these fundamental individuals. What a fundamental individual *is* consists in how it is disposed to behave. If the nature of an individual is the conjunction of its monadic properties, the nature of a fundamental individual, an electron, for example, is exhausted by its causal dispositions. It is difficult to see what more there could be to fundamental physical entities than their causal dispositions and spatio-temporal relations.<sup>12</sup> For example, what more could there be to a gravitational field at a point than its dispositions to induce various accelerations in various masses at that point? If the field had monadic properties that did not induce causal powers in it, how could these properties be detected? There is, then, good reason to agree with Karl Popper that ‘all properties of the physical world are dispositional ...’.<sup>13</sup>

(b) It follows that the (irreducibly) dispositional properties of a fundamental individual are essential to it. If so, such an individual cannot have, say, a spin magnitude of  $\frac{1}{2}$  Planck’s constant in one logically possible world but lack this magnitude in another; if an individual has such a spin magnitude, it has it in every logically possible world in which it exists. An electron would not be an electron if it did not have this spin magnitude, a negative charge, a mass of  $9.108 \times 10^{-28}$  grams, etc. Since fundamental individuals have all of their dispositional properties essentially, we may say that there is a logically necessary connection that links each such individual with its dispositional properties. Of course, this is not a causal connection.

(c) But there is also a logically necessary connection between the ‘triggering’ of a disposition and its manifestation. To see this, consider that a disposition is *necessarily* a disposition to do or suffer something, e.g. conduct electricity. Thus no disposition is merely contingently connected to what it is a disposition to do or suffer. It would be absurd to suppose that a

<sup>11</sup> Simon Blackburn ‘Filling in space’, *Analysis*, 50 (1990), 62–65.

<sup>12</sup> Cf. P. J. Holt ‘Causality and our conception of matter’, *Analysis*, 37 (1976), 20–29; Evan Fales ‘Essentialism and the elementary constituents of matter’, in French et al. (eds.) *Midwest Studies in Philosophy XI* (Minneapolis: University of Minnesota Press, 1986), 396; Howard Robinson *Matter and Sense* (Cambridge: Cambridge University Press, 1982), ch. 7; Brian Ellis and Caroline Lierse ‘Dispositional essentialism’, *Australasian Journal of Philosophy*, 72 (1994), 27–45.

<sup>13</sup> Karl R. Popper *Quantum Theory and the Schism in Physics* (London: Routledge, 1982), 159.

disposition to conduct electricity might have been a disposition to dissolve in water. So in a situation in which a disposition is activated, the manifestation event (logically) cannot fail to occur. If a current is caused to flow in a copper wire by being exposed to a voltage differential, and if this involves the activation of a causal disposition, then the total cause logically necessitates the effect.

(d) Conjoining (b) and (c) we may infer that there is not only a logically necessary connection between an electron (say) and its disposition to repel like-charged particles, but also between the triggering of the disposition (the approach of a like-charged particle) and the manifestation of the disposition. The upshot is obvious: in every logically possible world in which our electron is presented with a like-charged particle, it will repel said particle. *Pace* Hume, the approach-event logically necessitates the repulsion-event.

(e) And of course what is true of any arbitrary electron is true of the lot of them. It cannot be that some electrons have the property of being negatively-charged essentially while others have this property accidentally. (P is an essential property = df Necessarily, for any  $x$ , if  $x$  exemplifies P, then  $x$  cannot fail to exemplify P.) Hence it is a logically necessary law of nature that every electron is negatively-charged, that every electron repels like-charged particles, etc. From this it follows that if the event of an electron's being presented with a like-charged particle causes in its circumstances the repulsion of the like-charged particle, then the former event logically necessitates the latter.

(iii) *In defence of irreducible dispositions*

The upshot is that *if* things in nature have irreducible dispositions (active and passive causal powers, capacities, etc.), then any causal transactions into which they enter will be ones in which the cause logically necessitates the effect.

But are there irreducible dispositions in nature? Consider such vector properties as velocity, acceleration, momentum and force. I believe a strong case can be made for the view that some vector properties are genuine intrinsic properties of objects at times, that these properties are dispositional, and that these properties are *irreducibly* dispositional, i.e. not necessarily such that they are either identical with, or supervenient upon, non-dispositional properties. And of course, if these properties are irreducibly dispositional, then they must play a genuine causal role; lacking categorical bases, no categorical base can do their work for them.

A vector (in physics) is a physical quantity possessing both a magnitude and a direction. Suppose a projectile  $p$  is moving at constant velocity during some temporal interval I. Is  $p$ 's velocity at each instant  $t$  in I an intrinsic property of  $p$  at  $t$ , or is  $p$ 's velocity a matter of a relation between  $p$ 's position at one time and its positions at neighbouring times? Russell took the latter

view. On his ‘at-at’ theory of motion, ‘Motion consists *merely* in the occupation of different places at different times ...’.<sup>14</sup> Russell therefore rejected ‘velocity and acceleration as physical facts (i.e. as properties belonging *at each instant* to a moving point, and not merely real numbers expressing limits of certain ratios) ...’.<sup>15</sup> Russell’s view has been felt by many to be counterintuitive. Michael Tooley has recently presented strong arguments against it, and in favor of the view that velocity and force (though not acceleration) are intrinsic properties at instants. Here is one consideration suggested by Tooley’s discussion.<sup>16</sup> If *p* moves from position A to position B in a certain time, it seems natural to explain causally *p*’s arrival at B in that period of time by citing such facts as that *p* at A was moving at such and such velocity and that *p* was not acted upon by any other force in the translation from A to B. But such a causal explanation requires that velocities be properties had intrinsically by objects at each instant – which is what Russell denies.

Armstrong presents the following example he borrows from Bigelow and Pargetter:

A meteor crashes into Mars, making a crater. The size of the crater is proportional to the force exerted on impact, together, of course, with whatever Mars happens to be doing at that instant. But if that force is not something, a property presumably, that the meteor has *at the moment of impact*, then how is the particular size of the crater to be explained? ... Surely it is the mass of the object, *and its velocity at the instant of impact*, together with the current state of Mars, that determines the rest of the causal process? So the velocity had better be a property that really qualifies it at that instant.<sup>17</sup>

These and other considerations I do not have the space to adduce give us good reason to believe that some vector properties are genuine intrinsic properties of objects at times. But surely they are also *dispositional* properties. To say that a particle has a velocity at an instant is just to say what it is disposed to do in the immediate future unless acted upon by a further force. But is this vector property *irreducibly* dispositional? Armstrong, as a Categoricalist, simply declares that vectors have categorical bases without indicating what they are.<sup>18</sup> But it is difficult to see what the categorical base for velocity could conceivably be. The nature of this vector property would seem to be wholly exhausted by the causal power it induces in its possessor. There doesn’t seem to be anything categorical (non-dispositional) about it.

To sum up. A strong case can be made for the existence of irreducible dispositions in nature which are had essentially by the things that have them.

<sup>14</sup> Bertrand Russell *Principles of Mathematics* (New York: W. W. Norton & Co., no date), 473.

<sup>15</sup> *Ibid.*

<sup>16</sup> Michael Tooley ‘In defence of the existence of states of motion’, *Philosophical Topics*, **16** (1988), 238 ff.

<sup>17</sup> David Armstrong *States of Affairs*, 77. Cf. John Bigelow and Robert Pargetter *Science and Necessity* (Cambridge: Cambridge University Press, 1990), 72.

<sup>18</sup> David Armstrong *States of Affairs*, 249.

When such dispositions are manifested, the manifested effect is logically necessitated by the combination of factors comprising the total cause (the disposition, the trigger event, the relevant background conditions, etc.) We therefore have good reason to reject (P<sub>4</sub>).

## V

## AD (Q1): CASES OF MEREOLOGICAL GENERATION

Smith considers some examples of necessitarian causation from Sosa, but surprisingly ignores the one that poses the strongest threat to his position.<sup>19</sup> Suppose I make a primitive table by placing a board on a stump. But since we are not concerned with agent causation, all we need to assume is that a board ends up on a stump somehow, not necessarily by the action of a free agent. There are two events here. The first, call it  $e_1$ , is the board B's coming into a familiar spatial relationship to the stump S. The second, call it  $e_2$ , is the coming into existence of the table T.<sup>20</sup> This is a case of the generation of a particular, as opposed to a case of a change in an existing particular. A table that did not exist a moment ago now exists, and obviously enough, was caused to exist. As Sosa remarks, 'Surely such generation is a paradigm of ordinary causation'.<sup>21</sup> It seems equally obvious that this is a case in which the cause logically necessitates the effect: it is logically impossible that B be placed upon S without T coming into existence. Note, however, that this is not because  $e_1$  and  $e_2$  are the same event; they are clearly distinct. The first is a relational event involving two particulars, B and S; the second is a monadic event involving one particular, T. So we have two temporally successive events causally related with the first necessitating the second. This is a case of diachronic necessitarian event-causation.<sup>22</sup> It appears to refute Smith's claim that no cause is logically sufficient for its effect.

Consider a second example. Suppose hydrogen and oxygen molecules are combined to form a sample of water. This is clearly a case of causation (as opposed to non-causal supervenience, say), and a case in which a particular (a sample of water) is brought into existence. Perhaps the effect-event (the existence of the water) could exist without the particular cause it has, or any cause, but it seems obvious that the cause – the combining in the right proportions of the hydrogen and oxygen molecules – cannot (logically) exist without the effect. Thus cause and effect are not 'distinct existences' in the

<sup>19</sup> Cf. Ernest Sosa 'Varieties of causation', in Sosa and Tooley (eds.) *Causation* (Oxford: Oxford University Press, 1993), 234–242.

<sup>20</sup> For the example to work, it is not necessary that T be a table; it could be merely a table-shaped object. As an anonymous referee of this paper pointed out, it is not true that in every world in which a board ends up on a stump, a table comes into existence: there are no tables in worlds without purposive agents. But there could well be table-shaped objects in such worlds. <sup>21</sup> Sosa *Causation*, 234.

<sup>22</sup> One referee denied this, saying that the case is synchronic. She may well be right. If she is, this merely reflects on my classification of the example. The main point stands; this is a case in which the cause logically necessitates the effect.

sense of being separable, i.e., capable of independent existence. The water just is a product of the combining of the hydrogen and oxygen molecules; hence it cannot fail to come into existence when they are combined. And yet there are two distinct events here despite their not being Humean ‘distinct existences’. The one is the combining of the hydrogen and oxygen, the other is the coming into existence of water. They are distinct because the one event is relational while the other is monadic. Recall that we are assuming a theory of events as property/relation instantiations.<sup>23</sup> Cases like this are ubiquitous: two gametes join to produce a zygote, etc.

## VI

## AD (QI): CASES OF SYNCHRONIC NECESSITARIAN CAUSATION

There are also synchronic (simultaneous) cases in which causes appear logically to necessitate their effects. Consider a sample of water that is frozen solid. Why is it solid? One sort of causal explanation is in terms of preceding events: the water was left outside, the temperature dropped below freezing during the night, etc. This is a left-right, macro-macro explanation. But one can also causally explain the macro-property of solidity in bottom-up, micro-macro terms: the water is solid *because* (roughly) the H<sub>2</sub>O molecules are rigidly held in a lattice structure, which is in turn due to the relatively low mean molecular kinetic energy of the molecules, etc. Arguably, ‘because’ in the previous sentence signifies causation. It is unlike the ‘because’ in ‘this book is coloured because it is green’. It is also unlike other uses of ‘because’ such as the ‘because’ of metaphysical grounding, the ‘because’ of motive or intention, and others. I will return to the question whether the ‘because’ at issue here really signifies causation in a moment.

It seems equally clear in this example that the cause necessitates the effect, that it is impossible that the molecules be in their lattice configuration but the water composed of these molecules not be frozen. A sample of water just is a collection of H<sub>2</sub>O molecules, and this identity, though empirically discovered, holds necessarily. Hence the macro-properties of a water sample are determined by the micro-properties and micro-relations of the sample’s constituent molecules. Once the micro-properties and micro-relations are fixed, the macro-properties are ‘automatically’ fixed. In a theological image, for God to create ice, all he has to do is create H<sub>2</sub>O molecules in the requisite lattice configuration; there is nothing additional he must do to make the H<sub>2</sub>O molecules constitute a sample of ice. Determination relations are necessitation relations: if  $x$  determines  $y$ , then given  $x$ ,  $y$  cannot be otherwise. Not every determination relation is a causal relation, but (arguably) some are. An ice cube’s being cubical determines that it is three-dimensional, but

<sup>23</sup> See above III (i).

presumably does not cause it to be three-dimensional. But a collection of water molecules' being held rigidly in a lattice structure both determines and causes the water sample to be solid.

So what we seem to have here is a case in which the micro-level both determines and causes the macro-level. If so, the cause logically necessitates the effect. No doubt many will refuse to call this 'causation'. But it is undeniable that the micro-macro relation just described is a logically necessary connection *in nature*, and moreover, one that is known and can only be known a posteriori. It is not a 'relation of ideas' but a 'matter of fact' though not a matter of *contingent fact*. Whether or not we call it 'causation' is not important; what matters is that it is a counterexample to (P<sub>4</sub>) above, the premise that no two logico-semantically distinct natural events are such that one is logically sufficient for the other.

Another example. It is tempting to think of the relation of mental to physical properties in analogy with the relation of macrophysical to micro-physical properties. Succumbing to this temptation, John Searle writes that:

The brain causes certain 'mental' phenomena, such as conscious mental states, and these conscious states are simply higher-level features of the brain. Consciousness is a higher-level or emergent property of the brain in the utterly harmless sense of 'higher-level' and 'emergent' in which solidity is a higher-level emergent property of H<sub>2</sub>O molecules when they are in a lattice structure (ice) ...<sup>24</sup>

Note that in Searle's view the physical causes the mental, but also determines it. All one has to do to create a mind is to create a (biological) brain: once the brain properties are fixed, the mental properties are fixed. The latter cannot be reduced to the former, but they also cannot be realized without the former. So what we have is the view that brain property instantiations both cause and are logically sufficient for mental property instantiations.

One might try to analyse cases like these as cases of noncausal supervenience of macro- on micro-properties. So consider a case of strong emergence of a particular rather than a property. A particular P is strongly (weakly) emergent from its emergence base if and only if P has (does not have) causal powers of its own above and beyond the causal powers of its base. Consider an electromagnetic field surrounding an electromagnet. The field is a particular, not a property, although of course it has properties of its own. (It is therefore unlike the liquidity of a water sample which is a property of the latter and not a distinct particular.) The field is clearly an emergent entity: it is distinct from the magnet, but exists only as long as the magnet exists and current is flowing through it. One reason for the distinctness of field and magnet is that they occupy different regions of space. The solidity of a block of ice is spatially coextensive with the ice, but the field of a magnet can extend far beyond the latter's boundaries. Moreover, the field is strongly

<sup>24</sup> John R. Searle *The Rediscovery of the Mind* (Cambridge, MA: The MIT Press, 1992), 14.

emergent: it has causal powers of its own, such as the power to deflect compass needles and erase floppy disks. Given that the field causes the needle deflection, but the magnet does not, the magnet must cause the field. But the functioning electromagnet necessitates the existence of the field. Since the existence of the field causally depends on the electromagnet, the field is not a Humean ‘distinct existence’ which merely contingently stands in a causal relation to the magnet.

## VII

## AD (Q2): CAUSATION, SCHMAUSATION

Turning finally to (Q2), suppose that the objections I have just raised (from irreducible dispositionality, from mereological generation, and from synchronic causal determination) can all be adequately met. There remains a serious problem with Smith’s case for the logical impossibility of a divine cause. Suppose we simply give Smith his use of ‘cause’ – according to which no cause is a logically sufficient condition – but go on to claim that God’s willing, though it does not ‘cause’ anything (in Smith’s sense), creates or produces, and is thus logically sufficient for, the universe’s beginning and indeed each of its subsequent phases. This would appear to remove all the sting from Smith’s argument. The move is of the same form as Kripke’s ‘identity-schmididentity’ manoeuvre.<sup>25</sup> We give Smith ‘cause’ to be used in his way, and then reformulate our point by saying, fine, God does not cause the universe, he *schmauses* (creates) it, where a *schmause* is logically sufficient for its *schmeffect*. There is causation (in Smith’s sense) within the universe, but schmausation between God and the universe.

Smith anticipates this sort of objection and replies as follows: ‘But this change in terminology does not solve the problem: “*c* creates *e*” and “*c* produces *e*” each imply “*c* causes *e*”, so the problem is not avoided’ (180). This response is confused.

How are we to understand ‘cause’ in the quoted sentence? If we take it in Smith’s sense, then it is clearly *false* that ‘*x* creates *y*’ implies ‘*x* causes *y*’. For if *x* creates *y*, then *x* logically necessitates *y*; but if *x* causes *y* (in Smith’s sense), then *x* does *not* logically necessitate *y*. It is only if we take ‘cause’ in the ordinary language sense that ‘*x* creates *y*’ implies ‘*x* causes *y*’. Smith’s response confuses these two uses of ‘cause’. He helps himself to the ordinary language sense of ‘cause’ to turn aside the objection, when his argument requires a technical sense of ‘cause’ incompatible with the ordinary language sense.

Let me make this as clear as possible. Whether or not anything corresponds in reality to the concept of divine creation *ex nihilo*, Smith and I both understand this concept. By creating, God produces something without

<sup>25</sup> Saul A. Kripke *Naming and Necessity* (Cambridge, MA: Harvard University Press, 1980), 108.

producing it out of any pre-existent material. Clearly, divine producing logically necessitates the produced. It is equally clear that, on our ordinary concept of causation, divine creation is a case, indeed a paradigm case, of causation. But Smith thinks that in nature, no event we call ‘cause’ logically necessitates any event we call ‘effect’. Suppose he is right. What should we conclude? There are at least two possibilities, neither of which is logically forced. We can reserve ‘cause’ for natural events and refuse to apply it to God and his acts of will; or we can reserve ‘cause’ for God and his acts of will and refuse to apply it to natural events.

That is, we may adopt the position of ‘anti-Malebranche’ described in section I above; or we may adopt the position of ‘Malebranche’. Granting (P<sub>4</sub>) – no natural event is logically sufficient for any other – we can take this to show that God cannot be a cause, or, with an equal display of logical acumen, we can take it to show that there are no (genuine) causes in nature, that God alone is a (genuine) cause. ‘Malebranche’ and ‘anti-Malebranche’ are equally valid. Since both arguments assume the truth of (P<sub>4</sub>), Smith’s espousal of (P<sub>4</sub>) does nothing to support ‘anti-Malebranche’ over ‘Malebranche.’

How then can Smith stop the theist from going occasionalist and claiming that God’s willing of the Big Bang creates, but does not cause (in Smith’s sense of the term), the Big Bang? To stop the theist, Smith must support his assumption that creation *ex nihilo* is a case of causation (in his sense). But that is precisely what it is not: any creation of a new particular *ex nihilo* is a case in which the cause logically necessitates the effect. Once one has extruded necessitation from the concept of causation one cannot turn around and claim that creation is a case of causation – when it is clear that creation involves necessitation. To claim this is a bit like claiming that the material conditional (which is a purely truth-functional connective) captures the implication expressed by ‘if this is green, then this coloured’, or ‘if all men are mortal, then some men are mortal’. Or it is a bit like claiming, as I once heard it claimed, that *of course* polygraph (lie-detector) apparatus (which track respiratory and cardiac responses) detect lying because lying *just is* cardiac and respiratory spiking.

But to avoid even the appearance of verbal quibbling, suppose we give Smith not only ‘cause’, but also ‘produce’ and ‘create’ and even ‘will’ to use in his way. Now if what Smith is arguing is not to be utterly vacuous, he must be denying something. What he is denying is that causes logically necessitate their effects. So he cannot commandeer the word ‘necessitate’. He cannot so reinterpret ‘necessitate’ as to eliminate necessitation from it. So how can he stop the theist from claiming that God’s willing logically necessitates, but does not cause, produce or create (in Smith’s sense), the Big Bang? Clearly, he can’t. He cannot say that if God’s willing the Big Bang necessitates the Big Bang, then it causes the Big Bang. For as he uses ‘causes’,

if  $x$  necessitates  $y$ , then  $x$  does *not* cause  $y$ . So even if Smith has succeeded in showing (which we do not grant) that there is no non-divine causal necessitation, the theist will always have the option of holding that God is not a cause but a necessitator.<sup>26</sup>

<sup>26</sup> I thank Quentin Smith for comments on the antepenultimate draft, and the *Religious Studies* referees for comments on the penultimate one.