

# Causation

by Uwe Meixner, University of Augsburg

## Introduction

Philosophers who wish to offer an analysis of the concept of causation are confronted with a dilemma: either they have to make many conceptual decisions – quite a few of which appear to be arbitrary – in opting for the *one* concept of causation; or they have to accept *many* concepts of causation, all equally justifiable. It is a curious fact about contemporary philosophy (and mainly the philosophy of mind) that causation is often treated as an entirely unproblematic, uniquely identifiable concept; as if we all knew what causation is. The problematic nature of causation can be brought out by a series of philosophical questions. The answers to all of these questions are controversial, in varying degrees.

## The ontological categorization of the causal relata

Whatever causation is, it is the relation between causes and effects. The first question, then, is this: *What is the ontological category of effects?* Outside philosophy, *substance-like individuals* are considered effects: *children* are effects of their parents, or of their parents' generative acts; *paintings* are effects of their creators, or of the artistic work of their creators; and so forth. Within philosophy, effects are usually considered to be *events*: *car-accidents* are effects of road-conditions, or driving-mistakes; *linguistic utterances* are effects of speakers. Some philosophers – for example, (Mellor 1995) – have opted for effects being *states of affairs* or *facts*: *that John came too late to the meeting* was the effect of his decision to take a nap.

The second question about causation is this: *What is the ontological category of causes?* In ancient and in medieval philosophy, and still in much of everyday talk about causation, causes are substance-like individuals: (causal) agents. In modern philosophy, however,<sup>1</sup> causes have seemed to most philosophers to be events, though some have opted for facts: see, again, (Mellor 1995). Thus, the usual modern view is that not only effects but also causes are events, and that causation is *event-causation*. In this view, all causal relations – whether there is *one* concept of causation, or *many* – turn out to be homocategorial relations: All causal *relata* belong to the same ontological category: that of events. However, even in modernity some philosophers believe that causation is a heterocategorial relation, or at least that there is a heterocategorial relation of causation besides the homocategorial one(s), frequently including in their belief the idea that the former is conceptually prior to the latter: see (Chisholm 1966), (Taylor 1973), (Bishop 1983), (Meixner 2001, 320–63), and (Meixner 2004a). The most important form of heterocategorial causation is event-directed agent-causation, where the causes are substance-like individuals (hence individuals entirely without temporal parts) and where the effects are events (hence individuals which always have temporal parts). Not to lose one's bearings in too many distinctions, I will restrict my attention in what follows to event-causation and/or event-directed agent-causation. Fact-causation will be left out of the picture. And there is another restriction: The ontological theory of event-like individuals (in particular, events) and of substance-like individuals (in particular, substances) is a necessary presupposition of causation theory but cannot be treated in this essay to the extent they deserve.<sup>2</sup>

## Structural principles of causation

The third question regarding causation is this: *What are the formal properties of causation?*

The formal properties of causation are given by structural principles. There is widespread unanimity that causation has the property of being *asymmetrical*.<sup>3</sup> Its asymmetry consists in the conceptual truth of the following principle: *What is a cause is not an effect of what it causes*. An asymmetrical relation is *ipso facto* also *irreflexive*; that is, we also have, on purely conceptual grounds, the following principle: *Nothing is a cause of itself*. It may seem that medieval and subsequent talk of God as *causa sui* (*ipsius*) – “cause of itself” – contradicts the irreflexivity and, therefore, the asymmetry of causation. But what the medieval philosophers meant is that God, a substance-like individual, causes *his own existence*, which, as something *caused*, can very well be taken to be a fact or even an event (broadly speaking). Thus, there need be no breach of irreflexivity here, since no fact or event is a substance-like individual. In fact, event-directed agent-causation is trivially asymmetrical and irreflexive, due to its heterocategorical nature. For event-causation, however, which is *per se* homocategorical, irreflexivity and asymmetry are by far less trivial. The question of what guarantees the asymmetry of event-causation is a pressing and very difficult question (see below).

Another rather uncontroversial formal property of causation is *transitivity*, which is expressed by the following structural principle: *What is a cause of something that causes another is also a cause of that other*. This is true of event-causation (making it a *transitive* relation) and, again, trivially true of event-directed agent-causation: the antecedent condition of transitivity is always unfulfilled, because the event that an agent causes does certainly not agent-cause another event (since no event is a substance-like individual), in other words: because event-directed agent-causation cannot of itself produce causal chains. Until the late seventeenth century, many philosophers, among them Aristotle and Thomas Aquinas, believed that also the following structural principle is true of causation: *If something has a cause, then it also has a cause that has no cause*.<sup>4</sup> Until the early twentieth century, even more philosophers thought that the following structural principle is not only true of causation but an indispensable part of rationality: *Every event has a cause*. Today, neither the *first-cause principle* (the first-mentioned principle) nor the *general principle of causation* (the second-mentioned principle), nor the – albeit nameless – formal properties of causation that correspond to these principles, are widely accepted.

Note that these facts about the history of ideas are not mere “statistics” in the “sociology of knowledge”. They are of immediate philosophical relevance: The vicissitudes in the acceptance even of structural (or formal) principles of causation point to the conclusion that our grasp of causation is, at best, uncertain. For example, there is no decisive argument either for or against the *general principle of causation*. Nevertheless, the philosophical significance of its being accepted, or, on contrary, rejected, can hardly be overestimated (as will become apparent later in this essay).

## Causal asymmetry

The fourth question regarding causation is this: *What is it that guarantees the asymmetry of causation?* For event-directed agent-causation, this is an easy question, and it has already been answered above. For event-causation, it is a tough question. The standard answer to it is this: The cause-event temporally precedes the effect-event (and therefore cannot in turn be caused by the effect-event; for otherwise the effect-event would precede itself). Unfortunately, one would also like to speak of one event causing another if the cause-event does not temporally precede the effect-event: say, because they are simultaneous, or perhaps also because the cause-event temporally follows the effect-event. (This is called “retrocausation”; its possibility is argued for in (Dummett, *n.d.*) and (Lewis 1993).) The causal asymmetry one discerns even in the case of cause-effect simultaneity appears to be due to the fact that the cause is somehow *active* vis-à-vis the effect, and the effect *passive*, and hence not active, vis-à-vis the cause. (Compare (Taylor 1973, 32 and 36; Harré and Madden 1975, 114–15).) But what this activity-passivity asymmetry between cause and effect consists in – obviously it implies a certain assimilation of event-causation to agent-causation – is hard to get a conceptual grip on, in a general, principled way. One should not expect that its nature can be determined independently of any specific analysis

of event-causation.

## Causes *qua* sufficient conditions, and causes *qua* necessary conditions

The fifth question about causation is this: *Is a cause a necessary condition for its effect, or a sufficient condition, or a necessary and sufficient condition?* For agent-causation, the answer to this question is clear: The agent-cause *actualizes* the effect-event (brings it about, makes it happen). It is a sufficient condition of its effect (usually not absolutely, but only relatively: it is a sufficient condition given the general constitution of the world, the laws of nature, and the particularities of the situation of action). For event-causation, however, the answer is far from clear. Each of the three possible answers (indicated in the question itself) has advantages and disadvantages. If causes are necessary conditions for their effects (which, for example, is true of all immediate causes on the counterfactual analysis of causation in (Lewis 1986a)), then it seems easy to specify causes: because events which are necessary conditions for an event – events without which the event would not have occurred, so-called *conditiones sine qua non* – are, it seems, easy to find and to describe.<sup>5</sup> But, obviously, not all such *conditio-sine-qua-non* events can be causes. The event of my birth, for example, is a necessary condition for the event of my death, but one would not say that it is a *cause* of my death. What, then, is the difference between necessary conditions which are causes, and necessary conditions which are not? This is once more a question which is hard to answer in a general, principled way. And there is a further difficulty: Necessary conditions for an event *which are not also sufficient conditions for it* neither *satisfactorily explain (post factum)* nor *reliably produce (ante factum)* the event. However, causes are rightfully expected to satisfactorily explain or, at least, to reliably produce their effects. How, then, can non-sufficient necessary conditions be causes at all?

Causes *qua* sufficient conditions, on the other hand, reliably produce and usually also satisfactorily explain the events they are sufficient for (at least, if an explanation does not have to fulfil philosophically high expectations, as, for example, those of metaphysics). But it is usually far from easy to find events which are sufficient conditions for events one wishes to produce *ante factum* or explain *post factum*. It is normally hard work to find *sufficient causes*. And if one has found what appears to be a *sufficient cause*, then, considered from a certain angle, it still seems not really sufficient for its alleged effect after all, that is: not really productive or explanatory of it. It does not seem to be a really sufficient cause because, as a rule, its putative efficacy is, or was, more or less easily pre-emptible by some intervening event. To exclude causal pre-emption (the blocking of prospective sufficient causes), one is driven to adduce ever more comprehensive events as *really* sufficient causes – events which finally become so comprehensive (in content) as to be impossible to describe. And thus one is easily forced to “envisage” the entire past of the universe as the only really sufficient cause of a relatively small event in the present, or to accompany any “normal” causal explanation of it by the embarrassing comment “... and [fortunately or unfortunately] nothing happened to intervene”, which comment, of course, seriously depreciates the explanation.

Probabilistic theories of causation – (Suppes 1970; Lewis 1986a, sec. appendix B) – are intended, among other things, to avoid both the problems of sufficient causation and of *sine-qua-non* causation. According to these theories, causes are neither sufficient nor necessary for their effects. All that causes do is, roughly, to make their effects more probable than those effects would have been without them. The rather serious drawback is that probabilistic causation is not causation in the proper sense of the word: causal dependence is certainly more than just probabilistic dependence. However, as long as the invoked concept of probability is objective and not subjective – not *degree of belief* – and as long as the effects and causes are individual events and not *types* of events, probabilistic causation can be treated as causation in an extended, secondary, analogical sense. There is a certain price to be paid even for this: One has to make sense of *single-case objective probability*, which not a few philosophers – for example, (Van Fraassen 1998, 57; Rott 1994) – believe to be a notion which, if really taken seriously, is

impossible to explain.<sup>6</sup>

## The problem of causal connection in event-causation

The sixth question about causation is this: *What is it that connects cause and effect?* Regarding event-causation, the answer for the majority of philosophers was and still is – in spite of the fairly devastating criticism in (*Hume 1978*) and (*Hume 1975*) – that the connection between cause and effect is a kind of *objective necessity*. This is as true of those who think that causes are necessary conditions for the effects they cause, as it is true of those who think that causes are sufficient conditions for the effects they cause. Whether one holds that E is a cause of E' only if E' would not have occurred without E, or holds that E is a cause of E' only if event E would not have occurred without E', in both cases one is invoking, by using the expression “would not”, a notion of *objective necessity*, more precisely speaking: a notion of *negative objective necessity*, of objective *impossibility*.

The invoked necessity is deeply problematic because it is supposed to be objective. It must be objective if it is to serve as the causal connection, because the causal connection – prior to any particular interpretation of it – is rightfully claimed to be an *objective* connection. The deep problem, pointed out by Hume, is initially an epistemological problem, and ultimately an ontological one: It is easy to verify that the distinct events E and E'<sup>7</sup> both occur (whether at the same time or in temporal sequence); but it is far from easy to verify that, in addition to co-occurring, E would – on purely objective grounds – not have occurred without E', or that E' would not have occurred without E. In fact, once one starts to follow a certain radical line of thinking in which nothing is being taken for granted, where, in particular, nothing is being taken for granted because people are in the habit of speaking in a certain way, one is quite at a loss how to make the truth of either of these counterfactual propositions even plausible. There seems to be *no* objective necessity that connects two distinct events. A particularly striking example of the apparent lack of connecting objective necessity between two distinct events is the following: Consider an event E which occurs or begins to occur at an arbitrary point of time *t*, and consider the totality of all events that occurred before *t*, the huge event E\*: the entire course of the world before *t*. Would E\* not have occurred without E? From the purely objective point of view, the answer to this question appears to be “No”: No, it is not true that E\* would not have occurred without E; it is true that E\* might have occurred without E. But then – given the reliance on objective necessity as the causal connection – even the total past does not seem to be a sufficient cause of an event that immediately follows upon it in time.

The persistent failure to find an objective necessity that connects two distinct events strongly suggests that there simply is no objective necessity that connects two distinct events. This is the best explanation of why such a necessity cannot be found. It is true that we accept many statements of the type “E would not have occurred without E'” (for example, “The burning of the match would not have occurred without the striking of the match”). But we cannot rest content with this, at least as philosophers. What is the *source* of the necessity invoked? It must be a purely objective source if necessity is to be the causal connection; for causation is a purely objective relation: a relation that obtains, or not obtains, whether or not we believe that the relevant facts obtain, or not obtain. Now, analysing assertions of the indicated type, one always finds that they are asserted as true on certain grounds, that they are founded on an implicit *basis*, the truth of which basis (or of its description) is presupposed by the asserter. What is this basis, or rather, these bases, since it is not always the same?

The general designation of these bases is “laws of nature and circumstances”. If E is a cause of E', and if this is taken to entail that E would not have occurred without E' (in *sufficient* causation) or that E' would not have occurred without E (in *conditio-sine-qua-non* causation), and if the question is why this is so, then the general answer is “laws of nature and circumstances” – and the next step is to describe the specific laws of nature and circumstances that underlie (as its specific basis) the causal connection between E and E'. But now we are at the very bottom of the difficulty: The circumstances, we may take it, are purely objective, but the

laws are not. For on what grounds is it determined that a certain general fact is a *law of nature*? That such a fact is a law of nature cannot be read in “nature’s book” (that is, it is not determinable on the basis of empirical facts); for a law of nature is not just some regularity in nature, it is more than that: it is *something necessary*. And how can we know that? In this way: A general fact is *made* a law of nature, is made into *something necessary*, by nobody else but *us* human beings – or rather, by our experts in natural laws – because of the central role which the general fact plays in *our* theories. Thus, the basis of the necessity which is thought to connect cause and effect in event-causation is not purely objective, because what goes into that basis is, in part, essentially dependent on *our making* (in fact, on the making of merely *some* of us).<sup>8</sup> Therefore, that necessity itself is not purely objective, and hence it cannot be what connects cause and effect in event-causation after all. *Or*, we have to give up the idea that event-causation is a purely objective relation.

If we do not want to do that – do not want to construe event-causation as subject-dependent, which is one of the solutions suggested in (*Hume 1975, 76–77*) – then the demand that distinct events be connected by objective necessity in order to be causally connected is demanding too much of causation *qua* event-causation. Such a demand would annihilate event-causation; for there simply is no objective necessity that connects distinct events. What else, then, is the objective causal connection between events, if it is not objective necessity? It is very hard to give a satisfactory answer to this question. No answer – including the solution first suggested in (*Hume 1975, 76–77*), which is known as the (necessity-free, pure) “regularity theory of causation” – has been found to be satisfactory so far. Some have argued – under the title of the naturalization, or physicalization, of causation – that the causal connection is the transfer of energy, or of momentum, from one event to another; but it rather seems that those who have such views – see, for example, (*Fair 1979*), (*Kistler 1998*) – are confusing what often, yet accidentally, *accompanies* the causal connection with the causal connection itself.

## The problem of causal connection in agent-causation

Due to the difficulty proponents of event-causation have with saying *what it is that connects cause and effect*, event-causation is a problematic idea. This insight is still not widely shared, although it has been on the table ever since David Hume’s famous analyses. Does agent-causation allow a more satisfactory answer than event-causation to the question of *what it is that connects cause and effect*?

An agent-cause does two things to its effect-event: (a) it selects it for actualization from a range of possible events, (b) it actualizes it. Thus, the connection between cause and effect in agent-causation may aptly be called *selection-actualization*. The existence of selection-actualization presupposes a metaphysics that many philosophers these days consider unacceptable to the point of absurdity. They do so in spite of the fact that from the phenomenological point of view – that is, in metaphysically unbiased contemplation of what we experience when we experience actions of ours as being free and *ours* – selection-actualization certainly seems to us to exist. The existence of selection-actualization implies, even experientially, that at certain moments of time in the (actual, or real) world several alternative, still unactualized possible events are in the power of a substance-like individual in such a way that precisely one of them will be chosen by that individual and made actual by it. Against the reality of this appearance, it has been alleged that there are no substance-like individuals (no “endurants”), that all individuals are event-like (following (*Lewis 1986b, 202–4, 210*)). A rather more frequent and traditional objection than the denial of substance-like individuals is the allegation of *determinism*: the allegation that at no moment of time several (two or more) alternative courses of the world are possible. Today, however, the most common objection is an allegation which is logically weaker than determinism: the allegation that at no moment of time several alternative courses of the world are possible in such a way that the eventual actualization of one of them is *not* a matter of pure chance but falls within the actualizing power of an agent. This latter position might be called “impotentialism”. In view of the standard interpretation of quantum mechanics, many philosophers today prefer *impotentialism* to *determinism*; they believe that impotentialism

(they do not call it that, of course) is the only position that their respect for science allows them to adopt (whereas formerly – until the beginning of the twentieth century – many philosophers believed that the only position compatible with science was determinism).

Under impotentialism, selection-actualization and, therefore, agent-causation are out of the question. But even if there are substance-like individuals, and even if there are moments of time at which alternative courses of the world are possible *and* relevant to the life-interests of substance-like individuals *and* somehow within their power, agent-causation nonetheless seems to be a mysterious transaction – and, usually, *mystery* is for philosophers a reason for rejection and dismissal. If there is agent-causation, events do not always occur as the result of other events, or as a “result” of chance, that is: they are not always event-caused or causelessly actual; rather, they often are the effects of substance-like individuals. The mystery of agent-causation is *not* the selection of an event for actualization, which selection appears, in the fullness of mental life, as the definite conscious decision to have a certain event or at least an event of a certain type actualized. *Willing* an event (that is, selecting it for actualization) is not mysterious; what is mysterious is the *actualization itself* of the selected (willed) event. How do we, and other agents, become *effective*? This is mysterious. Yet, in fairness it must be said that our effectiveness is not more mysterious than how an event can make an event that is distinct from it be an effect of it; or how an event can come about without any sufficient cause at all. If I choose to raise my arm – the bodily mechanics and the surroundings circumstances being stably ideal for this act –, then whether I raise my arm or not, and even whether I begin to raise my arm or not, seems up to chance or up to inscrutable fate, but not up to me. There seems to be, in other words, an ontological gap between *my willing* and *my effecting*. It is lucky for me that, usually, this apparent gap is somehow – mysteriously – bridged and my choice fulfilled. (In some cases, of course, it would have been lucky for me if the gap had *not* been bridged.)

Even before Hume some philosophers were acutely, though somewhat indirectly, aware of this problem. Nicolas Malebranche, for example, held that only God, in His absolute perfection, is *per se* effective; that only in His case there is really no gap between willing and effecting. According to Malebranche (*Malebranche 1991, 797, 800*), it is necessarily true of God, and only of God, that the will to actualize an event necessarily entails the actualization of the event by the one who wills it. Thus, God is necessarily the only “true cause” (similarly, Al-Ghazali: see (*Riker 1996*)). All choosers other than God often fail, and always can fail, to fulfil their choices. If they do appear to fulfil them, it is, according to Malebranche, really God – the only “true cause” – who is the fulfiller. The belief that all power of actualization (and some would add: and also all power of selection) is concentrated in a single all-powerful substance-like individual may simply be an expression of radical piety; *or* that belief – since it turns all effects of agent-causation into deeds of God, into special divine *actions*<sup>9</sup> – may be indicative of an epistemological fact: the fact that *actualization* is a humanly inscrutable mystery.

The question of *what it is that connects cause and effect* has brought out the problematic nature both of event- and agent-causation. The problem may be summed up in one brief sentence: *There is an apparent lack of (objective) connection between cause and effect, both in event-causation and in agent-causation.* This lack is *not apparent* if one – like Hume or, indeed, Husserl (*Husserl 1970, sec. § 9, b*) – expects no more of causation than merely to be the expression of the general manner in which things change, the reflection of an overarching regularity, of an all-pervasive pattern in the course of the events of this world – which, really, is not causation at all. In contrast, that lack of connection is *very much apparent* if the cause, whether event or agent, is supposed to be – in a sense close to the proper sense of the word – *the maker* of the effect. But this, precisely, is what we expect of causes and causation when we wish to answer the Second Leibnizian Question – see (*Leibniz 1989, sec. 7*) – in all of its possible metaphysical radicalness: *Why is it that things are thus and not otherwise?*<sup>10</sup>

What one always can do is to affirm (firmly believe) that the lack of connection is *only apparent*, that the connection is really there, though unknown to us in its specificity: that there really is an objective necessity that connects cause-event and effect-event, though we do not know *which necessity*; that agents really are the actualizers of their deeds, though we do not know *how they*

*do it.* From the philosophical point of view, of course, such a move is not very satisfactory.

## The conflict of causal principles

Besides *the connection problem* – which is the central problem of causation – there is another problem: the incompatibility between two central structural principles of causation. They cannot be true together, though many philosophers would have very much liked them to be true together. When considering, in section 2, the *third question* I pointed out some structural principles of causation. To give the structural principles of causation a more specific meaning, it is stipulated that the word “cause” in them is from now on to be understood in the sense of “sufficient cause”. The historically most important of all structural principles of causation (that is, *sufficient* causation), one believed in for thousands of years, is also important in the present context; it is the *general principle of causation*:

*Every event has a (sufficient) cause.*

Now, in connection with the rise of physics and natural science, many philosophers had come to believe that *the weak principle of causal closure (of the physical)* is true along with the general principle of causation: *Every physical event that has a cause has a physical cause.* They even believed that *the strong principle of causal closure* – *Every cause of a physical event is physical*, which entails the weak principle of causal closure but is not entailed by it – is true along with the general principle of causation. However, the standard interpretation of quantum physics strongly suggests that the following assertion is true of causation:

*There are many physical events which have no physical (sufficient) cause,*

in other words (due to mutual entailment):

*Many instances of physical chance exist.*

It is an immediate logical consequence of the frequent existence of physical chance and of the weak principle of causal closure that *there are many events which have no cause at all* – which contradicts the general principle of causation. Does that mean that the general principle stands refuted? No, it does not. For it is an immediate consequence of the frequent existence of physical chance and of the general principle of causation that *there are many physical events which have no physical cause but have a cause nonetheless* (namely, a non-physical one) – which contradicts the weak (and therefore also the strong) principle of causal closure. Thus, the frequent existence of physical chance makes it logically impossible (relative to it) that the general principle of causation and the weak principle of causal closure are true together – no matter how much naturalistically oriented philosophers would have liked such a union in truth. If physical chance exists (and it is certainly widely accepted that it does), then either the one or the other principle, or both, must be false. Even a single instance of physical chance – that is, a single physical event without a physical cause – suffices for this result.

The difficulty of *rationaly* determining which one of the two principles is false indicates a serious lacuna in our philosophical understanding of *what it is that the causal relation consists in*. It is true that most philosophers today hold on to the weak principle of causal closure and discard the general principle of causation; but this is simply due to a metaphysical bias in favour of materialism, the modern form of which is physicalism, and certainly not due to finding an intrinsically higher rational virtue in the weak principle of causal closure vis-à-vis the general principle of causation. It is true that science looks for physical causes if it looks for causes of physical events; but it has nothing to do with science (and everything with metaphysics) to assume *from the start* that there always is a physical cause of a physical event if there is a cause of it at all. And it is true that on the basis of the existence of physical chance the general principle of causation entails the existence of a non-physical cause. The existence of a non-physical cause is unacceptable to many philosophers because such causes do not fit into their world-view; but it certainly does not seem to be something that is intrinsically unreasonable. Only if the existence

of a non-physical cause were intrinsically unreasonable would the fact that the general principle of causation allows us to conclude the existence of such a cause from the existence of physical chance be a good reason to discard the general principle of causation.

That principle is obviously a near relative of *the principle of sufficient reason*. Denying the general principle of causation draws this latter principle in question, too, and thereby the rational structure of the world. Yet, from a philosophically radical point of view it can well be asked: Must truth always be rational? Is not the assumption that truth is always rational – which leads to assuming the principle of sufficient reason and the general principle of causation – motivated by something that is not rational at all, namely, by a species of *wishful thinking*?

## Causation theory and wishful thinking

Whatever the standing of the general principle of causation, it seems belief in the (strong or weak) principle of causal closure is indeed mainly motivated by metaphysical wishful thinking. And there is another instance where wishful thinking – coming to a large extent from the same quarter: physicalism – appears to be encroaching on causation theory. This other instance of wishful thinking involves the concept of *causal over-determination*. One speaks of *causal over-determination* if, and only if, there are two or more independent sufficient causes for an event. Now, especially physicalists like to assume that, at least as far as *mental causation* is concerned, causal over-determination is impossible: see (*Kim 2009, 39, 46*). The motivation for this assumption is not far to seek: the weak principle of causal closure does not preclude that some instance of human behaviour – a physical event – has a sufficient non-physical mental cause *in addition* to a sufficient physical, neurophysiological cause. Physicalists can close this gap in their armour by denying that causal over-determination is possible in the case of mental causation (but it could also be closed – slightly more plausibly – by assuming the *strong* principle of causal closure, not just the weak one).

The central objection to denying causal over-determination is that nature is under no obligation to conform to our favourite principles, while our favourite principles are under every obligation to conform to nature. There is, moreover, nothing that is intrinsically unreasonable in causal over-determination, least of all if it is over-determination of the systematic, nomological kind – because such over-determination would reveal an underlying unity in nature. Nomologically systematic over-determination, in particular, would be found to exist if mental events and the brain events that correspond to them – without being identical to them – were always *causally* (not cognitively, of course) *equivalent*, that is, if they always had the very same causes and the very same effects (it does not follow that they are identical). This idea is developed in Meixner (*Meixner 2004b, 296–313*) and dubbed “interactionist parallelism”. It is a scientific hypothesis about the mind-brain relation which is well worth exploring: see (*Meixner 2014*). The hypothesis should not be rejected from the start, on the mere basis of metaphysical wishful thinking.

Special divine action, on the other hand, is, today, far from appearing to be yet another case of metaphysical wishful thinking. There is a fairly hard fact and a rather rational structural principle of causation which, taken together, give special divine action a considerable plausibility. The fact in question is the existence of physical chance, the principle in question is the general principle of causation; together they entail the existence of a non-physical cause. Since some physical events without (sufficient) physical cause – say, momentous quantum fluctuations at the beginning of creation – are far remote from the sphere of human (and animal and angelic) interests, it is not far-fetched to suppose that the non-physical cause in these cases is God. The causation itself in these cases would be immediate divine agent-causation, that is, special divine action.

There is, of course, also a place for *non-special* divine action. All physical events which are determined *on the basis of the laws of nature* to happen because a previous physical event happened can be regarded as *non-special* divine actions. The constant, hence non-special and general (but nevertheless essential) contribution of God to the coming about of each of these



events is His making of the totality of the objective laws of nature: His setting down these particular laws for nature, laws that cannot be broken except by *special* – to boot, miraculous – divine action.