

# CAUSATION

## Chapter 12

### Causal Laws and the Relation of Causation

Is it possible for two events to be causally related, without that relationship being an instance of some causal law, either basic or derived, and either probabilistic or non-probabilistic? Since the time of Hume, the overwhelmingly dominant philosophical view has been that such a conception of causation is not coherent. I shall attempt to show, however, that that view is incorrect.

#### 12.1 Arguments in Support of a Singularist Conception of Causation

##### 12.1.1 Two Problematic Arguments in Support of a Singularist Account

What grounds might be offered for thinking that it is possible for one event to cause another, without that causal relation being an instance of any causal law? There are, I think, at least six lines of argument that are worth mentioning. Two of these I shall set aside as dubious. The other four, however, appear to be sound.

###### 12.1.1.1 Immediate Knowledge of Causal Relations?

One consideration that might be advanced starts out by appealing to the possibility of knowledge that two events are causally related which is based upon nothing beyond perception of the two events and their more or less immediate surroundings. The thrust of the argument is then that, since experience of such a very limited sort can surely not provide one with any knowledge of the existence of a law, it must be possible to know that two events are causally related without knowing that there is any law of which that relation is an instance. But if that is possible, then is it not also reasonable to suppose that it is possible for two events to be causally related, even if there is no corresponding law?

This general line of argument comes in different versions, corresponding to four slightly different claims concerning knowledge of causal relations. First, there is the claim that causal relations can be given in immediate experience, in the strong sense of actually being part of an experience itself. Secondly, there is the claim that, even if causal relations are not given in immediate experience, one can certainly have noninferential knowledge that states of affairs are causally related. Thirdly, there is the claim that causal relations are at least observable in many cases. Finally, there

is the claim that there are situations where observation of a single case can provide one with grounds for believing that two events are causally related, and that it can do so even in the absence of any prior knowledge of causal laws.

These four claims give rise to different arguments. But, while I shall not attempt to establish it here, I think that it is very doubtful that any of them can be sustained.

### 12.1.1.2 The Appeal to Intuition

A second line of thought involves the claim that if one simply examines one's ordinary concept of causation - of one event's bringing about, or giving rise to, another - one does not find any reference to the idea of a law. One's ordinary concept of causation is simply that of a relation between two events - that is to say, a relation that involves only two events, together with whatever causal intermediaries there may be, and nothing else. It cannot matter, therefore, what is the case in other parts of the universe, or what laws obtain.

Is there anything in this argument? Perhaps. For if it is true that, no matter how carefully one inspects one's ordinary concept of causation, one cannot see any reason why only events that fall under laws can be causally related, then that may provide *some* support for a singularist conception. But it would seem that that support must be, at best, very limited. For, given the great difficulty, not only in arriving at a satisfactory analysis of the concept of causation, but even in determining the correct direction in which to look, the fact that no connection with laws is immediately apparent when one introspectively examines one's ordinary concept of causation can hardly provide much of a basis for concluding that no such connection exists.

### 12.1.2 More Promising Lines of Argument

In this section, I want to mention four considerations that, though by no means compelling, constitute much more substantial reasons for accepting a singularist conception of causation. The four arguments consist of three that I have set out elsewhere, in a detailed way,<sup>1</sup> plus a natural variant. My discussion of them here, consequently, will be comparatively brief.

The four arguments all attempt to establish a singularist conception of causation by offering reasons for rejecting the alternatives. We need to consider, therefore, just what the alternatives are. The place to begin, clearly,

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<sup>1</sup>Laws and Causal Relations' in *Midwest Studies in Philosophy*, 9, ed. P. A. French, T. E. Uehling, and H. K. Wettstein, (Minneapolis, Minnesota: University of Minnesota Press 1984), 93-112, and *Causation - A Realist Approach*, (Oxford: Oxford University Press, 1988), ch. 6.

is with the dominant, supervenience view. According to it, events cannot be causally related unless that relation is an instance of some law. Moreover, whether or not two events are causally related is logically determined by the non-causal properties of the two events, and the non-causal relations between them, together with the causal laws that there are in the world. The supervenience view of causal relations involves, in short, the following two theses:

- (1) Causal relations presuppose corresponding causal laws;
- (2) Causal relations are logically supervenient upon causal laws plus the non-causal properties of, and relations between, events.

Traditionally, the supervenience view and the singularist view have been treated as the only alternatives on offer with respect to the question of the relation between causal relations and causal laws. It is clear, however, that there is a third alternative, since the first of the above theses is compatible with the denial of the second. There is, accordingly, a view that is intermediate between the singularist position and the supervenience position - the view, namely, that causal relations presuppose corresponding causal laws, even though causal relations are *not* logically supervenient upon causal laws together with the non-causal properties of, and relations between, events.

The relevance of this for the present arguments is that each argument involves two distinct parts - one directed against the supervenience view, and the other directed against the intermediate view. In the case of the supervenience alternative, the strategy is to describe a logically possible situation that is a counterexample to the supervenience account. The counterexamples have no force, however, against the intermediate view, so some other line of argument is called for, and what I shall argue is that the singularist view is to be preferred to the intermediate view on grounds of simplicity.

### **12.1.2.1 The Argument from the Possibility of Indeterministic Laws**

The first argument starts out from the plausible - though by no means indubitable - assumption that indeterministic causal laws are logically possible. Granted that assumption, consider a world with only two basic causal laws:

For any  $x$ ,  $x$ 's having property  $P$  is causally sufficient to bring it about that either  $x$  has property  $Q$  or  $x$  has property  $R$ ;

For any  $x$ ,  $x$ 's having property  $S$  is causally sufficient to bring it about that either  $x$  has property  $Q$  or  $x$  has property  $R$ .

In such a world, if an object has property *P*, but not property *S*, and then acquires property *Q*, but not property *R*, it must be the case that the acquisition of property *Q* was caused by the possession of property *P*. Similarly, if an object has property *S*, but not property *P*, and then acquires property *Q*, but not property *R*, it must be the case that the acquisition of property *Q* was caused by the possession of property *S*. But what if an object has both property *P* and property *S*? If the object acquires only property *Q*, there will be no problem: it will simply be a case of causal overdetermination. Similarly, if it acquires only property *R*. But what if it acquires *both* property *Q* and property *R*? Was it the possession of property *P* that caused the acquisition of property *Q*, and the possession of property *S* that caused the possession of property *R*, or was it the other way around? Given a supervenience view of causation, no answer is possible, for the causal laws in question, together with the non-causal properties of the objects, do not entail that it was one way rather than the other.

Can an advocate of a supervenience view argue successfully that this case is not really a counterexample? One try would be to say that in the case where an object has both property *P* and property *S*, and then acquires properties *Q* and *R*, there are *no* causal relations at all involved. But that won't do, since the first law, for example, implies that the possession of property *P* always causes something.

Another attempted escape would be to argue that there are causal relations in the situation, but they are not quite as determinate as one might initially assume. Thus it is not the case either that the possession of property *P* causes the possession of property *Q*, or that it causes the possession of property *R*. What is true is that the possession of property *P* causes the state of affairs which involves either the possession of property *Q*, or the possession of property *R*.

But this, I believe, will not do either. The reason is that causal relations hold between states of affairs, and, while one may use disjunctive expressions to pick out states of affairs, states of affairs in themselves can never be disjunctive in nature. Accordingly, if the situation described is to involve causal relations falling under the relevant laws, it must be the case either that the possession of property *P* caused the acquisition of property *Q*, or that it caused the acquisition of property *R*, and similarly for property *S*.

It would seem, then, that the possibility of indeterministic causal laws gives rise to a very strong objection to the supervenience view of causal relations. But what of the intermediate view? Obviously, the above argument leaves it unscathed, since, in the situation being considered, all of the causal relations fall under causal laws. So if the intermediate view is to be rejected, some other argument is needed.

The only possibility that I can see here is a somewhat modest argument which turns upon the fact that the intermediate view involves a somewhat richer ontology than the other views. For consider, first, the supervenience view. Given that, according to it, causal relations between states of affairs are logically supervenient upon causal laws plus non-causal states of affairs, the only basic causal facts that need to be postulated are those that correspond to causal laws. (According to the view of causal laws that I have defended elsewhere, such facts are to be identified with certain contingent relations between universals.<sup>2</sup>)

Secondly, consider the singularist view. According to it, it is causal relations that are in some sense primary, rather than causal laws. So the singularist view is certainly committed to postulating basic causal facts which involve states of affairs standing in causal relations. But what account is to be offered of causal laws? If a regularity view of laws were tenable, nothing would be needed beyond regularities involving the relation of causation. However, as a number of philosophers have argued, regularity accounts of the nature of laws are exposed to very strong objections.<sup>3</sup> Let us suppose, therefore, that a singularist account of causation is combined with the view that laws are relations among universals. The result will be that a singularist approach involves, in the case of any world that contains causal laws, the postulation of two sorts of basic causal facts - consisting, on the one hand, of relations between particular states of affairs, and, on the other, of relations between universals.

At first glance, then, the singularist approach might seem to have a more luxuriant ontology than the supervenience approach, since the latter postulates only one type of causal fact, whereas the former postulates two. But I think that further reflection undermines that conclusion. The reason is that both approaches need to leave room for the possibility of *non-causal* laws. When this is taken into account, it can be seen that both approaches need to postulate exactly two fundamental sorts of facts, in the general area of laws and causation. For, on the one hand, the supervenience view needs to postulate two special types of facts in order to distinguish between causal laws and non-causal laws, while, on the other, the singularist approach can also account for everything while postulating only two special sorts of facts. For although it cannot reduce causal laws to causal relations between states of affairs, it can analyse the concept of a causal law in terms of the concept of a law - causal or otherwise - together with the concept of causal relations.

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<sup>2</sup>*Causation*, ch. 8.

<sup>3</sup>Fred I. Dretske, 'Laws of Nature', *Philosophy of Science*, **44**, 1977; David M. Armstrong, *What is a Law of Nature?*, (Cambridge: Cambridge University Press 1983), esp. ch 1-5; and my own discussions in 'The Nature of Laws', *Canadian Journal of Philosophy*, **7**, Number 4, 1977, and in *Causation*, section 2.1.1.

In short, the situation is this. Both approaches need an account of the nature of laws. Given that, the supervenience view then goes on to explain what it is that distinguishes causal laws from non-causal laws, and then uses the notion of a causal law to offer an analysis of what it is for two states of affairs to be causally related. The singularist view, on the other hand, has to explain what it is for two states of affairs to be causally related, and it then uses that concept, in conjunction with that of a law, to explain what a causal law is. The two approaches would seem, therefore, to be on a par with respect to overall simplicity.

But what of the intermediate account? The answer is that it is necessarily more complex. Since it denies that causal relations between events are logically supervenient upon causal laws together with the totality of non-causal facts, it is committed, like the singularist approach, to postulating a special relation that holds between states of affairs. But, unlike the singularist approach, it cannot go on to analyse causal laws as laws that involve the relation of causation. For the latter sort of analysis makes it impossible to offer any reason why it should be the case that events can be causally related only if they fall under some law. Accordingly, if the exclusion of anomic causation is to be comprehensible, given an intermediate view, one needs to offer a separate account of the nature of causal laws.<sup>4</sup> The upshot is that an intermediate account needs to postulate three special sorts of facts: those corresponding to non-causal laws, those corresponding to causal laws, and those corresponding to causal relations between states of affairs. An intermediate account therefore involves a somewhat richer ontology than either a singularist approach or a supervenience approach.

This completes the argument. For we have seen, first, that there are only two alternatives to a singularist conception of causation - namely, the supervenience view and the intermediate view. Secondly, one of the alternatives - the supervenience view - is ruled out by certain logically possible cases involving indeterministic causal laws. Thirdly, the other alternative - the intermediate view - is ontologically less economical than the singularist view. Other things being equal, therefore, the singularist approach is to be preferred.

### **12.1.2.2 The Argument from the Possibility of Uncaused Events and Probabilistic Laws**

The second argument is, in a sense, a simpler version of the previous one. It does involve, however, two additional assumptions - namely, that both probabilistic laws, and uncaused events, are possible.

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<sup>4</sup>For a more detailed discussion, see *Causation*, 268-74.

Given those two assumptions, the argument runs as follows. Imagine a world where objects sometimes acquire property *Q* without there being any cause of that occurrence. Suppose, further, that the following is a law:

For any *x*, *x*'s having property *P* causally brings it about, with probability 0.75, that *x* has property *Q*.

If objects sometimes acquire property *Q* even though there is no cause of their doing so, then why shouldn't this also be possible in cases where an object happens to have property *P*? Indeed, might there not be excellent reason for thinking that there were such cases? For suppose that objects having property *P* went on to acquire property *Q* 76 percent of the time, rather than 75 percent of the time. That would not necessarily be grounds for entertaining doubts concerning the above law, since that law might be derived from a very powerful, simple, and well-confirmed theory.

In that situation, one would have reason for believing that, over the long term, of the 76 out of 100 cases when an object with property *P* acquires property *Q*, 75 will be ones where the acquisition of property *Q* is caused by the possession of property *P*, while the other will be one where property *Q* is spontaneously acquired. But if one adopts a supervenience view, what state of affairs serves to differentiate the two sorts of cases? No answer can be forthcoming, since, by hypothesis, there are no differences with respect to non-causal properties or relations. The above possibility is a counterexample, therefore, to a supervenience view of causal relations.

### 12.1.2.3 The Argument from the Possibility of Exact Replicas of Causal Situations

The third argument runs as follows. Suppose that event *P* causes event *M*. There will, in general, be nothing impossible about there also being an event *M\** which has precisely the same properties<sup>5</sup> as *M*, both intrinsic and relational, but which is not caused by *P*. But is it logically possible for it to be the case that, in addition, either (1) the only relation between *P* and *M* is that of causation, or else (2) any other relation that holds between *P* and *M* also holds between *P* and *M\**?

If either of these situations can obtain, we have a counterexample to the supervenience view. For assume that the supervenience approach is correct. That means that *P*'s causing *M* is logically supervenient upon the non-causal properties of, and the non-causal relations between, *P* and *M*, together with the causal laws. But if *M\** has precisely the same non-causal properties as *M*, and also stands to *P* in the same non-causal relations as *M* does, then the supervenience thesis entails that *P* must also cause *M\**, contrary to our hypothesis.

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<sup>5</sup>The only restriction upon properties here is that they must not involve particulars.

An advocate of the supervenience view might well challenge, of course, the assumption that situations of the above sort are possible. But I believe that the assumption can be sustained, and elsewhere I have advanced three sorts of cases in support of it,<sup>6</sup> two of which I shall mention here. The first involves two assumptions. First, that there could be immaterial minds that were not located in space, but which could be causally linked - say, by "telepathy". Secondly, that there could also be two such minds that were in precisely the same state at every instant. Granted these assumptions, one has a counterexample of the desired sort to the supervenience view: a case, namely, where a mind  $P$  is causally linked to a mind,  $M$ , but not to a qualitatively indistinguishable mind,  $M^*$ .

A second sort of case involves the following three assumptions. First, that it is logically possible for there to be worlds that exhibit, at least some of the time, rotational symmetry. Secondly, that enduring objects have temporal parts, and that it is causal relations between those parts that unite them into enduring objects. Thirdly, that the only external relations that hold between complete temporal slices of a universe, or between parts of different complete temporal slices, are causal and temporal ones. Given those assumptions, consider, for example, a Newtonian world that contains only two neutrons, endlessly rotating in the same direction around their centre of gravity. Choose any time,  $t$ , and let  $U$  be the temporal part that contains events at  $t$ , together with all prior events, while  $V$  contains all later events. The thrust of the argument is then that the rotational symmetry that characterizes such a world at every moment means that a supervenience view cannot give a satisfactory account of the causal connections between the two temporal parts. For if  $P$  and  $P^*$  are the earlier temporal parts of the two neutrons, and  $M$  and  $M^*$  the later temporal parts, it will be impossible, given a supervenience view, to hold that  $P$  is causally linked to  $M$ , but not to  $M^*$ , since  $M$  and  $M^*$  have the same properties, both intrinsic and relational, and there is no non-causal relation that holds between  $P$  and  $M$ , but not between  $P$  and  $M^*$ .

If the subsidiary assumptions can be defended in either or both of these cases - and I believe that they can<sup>7</sup> - then one has another sort of counterexample to the supervenience view.

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<sup>6</sup>Laws and Causal Relations', 99-107.

<sup>7</sup>Some axiomatic formulations of Newtonian spacetime involve the postulate of a generalized betweenness relation that, rather than being restricted to locations at a given time, can hold between spacetime points belonging to different temporal slices. See, for example, Hartry Field's *Science Without Numbers*, (Princeton: Princeton University Press, 1980), 52-3. But the idea that such a spatiotemporal relation can be basic is, I believe, very dubious.



#### 12.1.2.4 The Argument from the Possibility of Inverted Universes

Let us say that two possible worlds are inverted twins if they are exactly the same except for the direction of time and for any properties or relations that involve the direction of time. Whether a possible world has an inverted twin depends upon what the laws of nature are. Some laws will exclude inversion; others will not.

Consider, for example, any world that is governed by the laws of Newtonian physics. For any instantaneous temporal slice,  $S$ , of that world, there will be another possible Newtonian world that contains an instantaneous temporal slice,  $T$ , such that  $T$  involves precisely the same distribution of particles as  $S$ , but with velocities that are exactly reversed. Given that the laws of Newtonian physics are symmetric with respect to time, the course of events in the one world will be exactly the opposite of that in the other world. Any Newtonian world necessarily has, therefore, an inverted twin.

Imagine, then, for purposes of illustration, that our world is a Newtonian world. There will then be a possible world that is just like our world, except that the direction of time, and the direction of causation, are, so to speak, reversed. That is to say, if we let  $A$  and  $B$  be any two complete temporal slices of our world, such that  $A$  is causally and temporally prior to  $B$ , then the other world will contain temporal slices  $A^*$  and  $B^*$  such that, first,  $A^*$  and  $B^*$  are indistinguishable from  $A$  and  $B$ , respectively, except with respect to properties that involve the direction of time, and secondly,  $B^*$  is causally and temporally prior to  $A^*$ . So there will be, for example, a complete temporal slice of the twin world that is just like a temporal slice of our own world in the year 1600 A.D., except that all properties that involve the direction of time - such as velocity - will be reversed. Similarly, there will be a complete temporal slice that corresponds, in the same way, to a temporal slice of our own world in the year 1700 A.D. But both the causal and the temporal orderings will be flipped over, with the 1700-style slice both causally prior to, and earlier than, the 1600-style slice.

The question now is this. What makes it the case that, in our world,  $A$  causes  $B$ , whereas in the inverted twin world,  $B^*$  causes  $A^*$ ? If one adopts a supervenience account, then, in view of the fact that the two worlds have, by hypothesis, the same laws, the difference must be a matter either of some difference between  $A$  and  $A^*$ , or between  $B$  and  $B^*$ , with respect to non-causal properties, or else of some non-causal relation that holds between  $A$  and  $B$ , but not between  $A^*$  and  $B^*$ . Can such a difference be found?

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One difference is that while *A* is earlier than *B*, *A\** is later than *B\**, rather than earlier. But is this a non-causal difference? The answer depends upon the correct theory of the nature of time. In particular, it depends upon whether the direction of time is to be analysed in terms of the direction of causation. If, as I am inclined to believe, it is, then the causal difference between the two worlds cannot be grounded upon the temporal difference. But this, in turn, also means that *A* and *A\** cannot differ with respect to their non-causal properties, and similarly for *B* and *B\**. For, by hypothesis, *A* differs from *A\** only with respect to those properties that involve the direction of time, and those differences will not be non-causal differences if the direction of time is to be defined in terms of the direction of causation.

The crux of this fourth and final argument, in short, is the assumption that the direction of time is to be analysed in terms of the direction of causation. If that assumption cannot be sustained, the argument collapses. But if it can be sustained, the argument appears to go through, since *A* will not then differ from *A\** with respect to any non-causal properties, nor *B* from *B\**, nor will there be any non-causal relation that holds between *A* and *B* but not between *A\** and *B\**. The possibility of inverted universes will thus constitute another counterexample to the supervenience view of causation.

To sum up. The four arguments that I have set out in this section constitute, I believe, a very strong case against the supervenience view. As we have seen, however, this is not to say that there is a strong case for the singularist conception of causation. For there is a third alternative - the intermediate view - which escapes the objections to which the supervenience account is exposed. Nevertheless, with the field thus narrowed, there is at least some reason for preferring the singularist view, since it involves a more economical ontology.

## 12.2 Arguments against a Singularist Account?

I have argued that, other things being equal, the singularist view is to be preferred. But are other things equal, or are there, on the contrary, strong objections to a singularist conception of causation?

Given that very few philosophers indeed have embraced a singularist view, it is natural to suppose that very strong objections, if not out and about, must at least be lurking on the sidelines. But is that so? Perhaps, instead, it has simply been taken for granted that a singularist view cannot be right, that causal relations must fall under laws? That certainly seem to have been the feeling of Elizabeth Anscombe, as the following, somewhat caustic comment on Davidson, and others, testifies:

Meanwhile in non-experimental philosophy it is clear enough what are the dogmatic slumbers of the day. It is over and over again assumed that any singular causal proposition implies a universal statement running "Always when this, then that"; often assumed that true singular causal statements are derived from such 'inductively believed' universalities. Examples indeed are recalcitrant, but that does not seem to disturb. Even a philosopher acute

enough to be conscious of this, such as Davidson, will say, without offering any reason at all for saying it, that a singular causal statement implies *that there is* such a true universal statement - though perhaps we can never have knowledge of it. Such a thesis needs some reason for believing it!<sup>8</sup>

Such a thesis does indeed need support. However I believe that Anscombe is wrong in suggesting that the widespread philosophical acceptance of the view that causal relations presuppose laws does not rest upon any argument. For it seems to me that the reason that one rarely encounters any arguments bearing upon this thesis is that most philosophers have generally been convinced by Hume's argumentation on the matter, regardless of whether they have accepted or rejected his positive account of the nature of causation.

We need to consider, therefore, the Humean line of argument. It has, in effect, two parts. The first involves the claim that causal relations are not observable in the relevant technical sense of being immediately given in experience. The second involves the claim that causal relations are not analytically reducible to observable properties and relations *unless* one looks beyond the individual case.

How might it be argued that causal relations are not immediately given in experience? A standard empiricist argument might run as follows. First, to say that a property or relation is immediately given in an experience is to say that it is part of the experience itself, and where the latter is so understood that a property or relation can be part of an experience *E* only if it would also have to be part of any experience that was qualitatively indistinguishable from *E*. Secondly, given any experience *E* whatever - be it a perception of external events, or an introspective awareness of some mental occurrence, such as an act of willing, or a process of thinking - it is logically possible that appropriate, direct stimulation of the brain might produce an experience, *E\**, which was qualitatively indistinguishable from *E*, but which did not involve any causally related elements. So, for example, it might seem to one that one was engaging in a process of deductive reasoning, when, in fact, there was not really any direct connection at all between the thoughts themselves - all of them being caused instead by something outside of oneself. It then follows, from these two premises, that causal relations cannot be immediately given in experience in the sense indicated.

But what is the significance of this conclusion? The answer is that it then follows, according to traditional empiricism, that the concept of causation cannot be analytically basic. For one of the central tenets of empiricism is that not all ideas can be treated as primitive. In particular, an idea can be treated as analytically basic only if it serves to pick out some

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<sup>8</sup>G. E. M. Anscombe, 'Causality and Determination', *Causation*, ed. Ernest Sosa and Michael Tooley, (Oxford: Oxford University Press 1993), 88-104. See p. 104.

property or relation with which one is directly acquainted. But what properties and relations can be objects of direct acquaintance? Within traditional empiricism, the answer is that one can be directly acquainted only with properties and relations that can be given within immediate experience. It therefore follows that if traditional empiricist views concerning what concepts can be treated as analytically basic are sound, the concept of causation cannot be treated as analytically basic. It stands in need of analysis.

Is traditional empiricism right on these matters? I believe that it is. Arguing for that view would, however, take us rather far afield. For the way that I would want to proceed is by showing, first, that, *pace* Wittgenstein, a private language is unproblematic, and secondly, that while concepts that involve the ascription of secondary qualities to external objects can be analysed in terms of concepts that involve the ascription of qualia to experiences, analysis in the opposite direction is impossible.

This brings us to the second stage of the Humean argument - the part which is directed to showing that a singularist conception of causation makes it impossible to analyse causation in terms of observable properties and relations. Hume's argument here involves asking one to try to identify, in any case where one event causes another, what it is that constitutes the causal connection. He suggests that when we do so, we will see, first, that the effect comes after the cause, and secondly, that cause and effect are contiguous, both temporally and spatially. But these two relations, surely, are not enough. Something more is needed, if events are to be causally related. But what can that something more possibly be?

In response to this question, Hume argues that, regardless of what sort of instance one considers - be it a case of one object's colliding with another, or a case of a person's performing some action - one will find that there is neither any further property, either of the cause or of the effect, nor any further relation between the two events, to which one can point. Hume therefore concludes that if one is to find something that answers to our concept of causation, one has to look beyond any single instance, and he then goes on to argue that if one has to look beyond single instances, the only situations that could possibly be relevant are ones involving events of similar sorts, similarly conjoined. Thus one is led, in the end, to the conclusion that our idea of causation is in some way necessarily linked with the idea of regularities, of constant conjunctions of events.<sup>9</sup>

How might one attempt to rebut this argument? One line, which appears to be embraced by Anscombe,<sup>10</sup> involves the attempt to move from

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<sup>9</sup>David Hume, *A Treatise of Human Nature*, Part 2, Section 14, and *An Inquiry Concerning Human Understanding*, section 7.

<sup>10</sup>*Op. cit.*, 67-9.

the claim that causation is observable to the conclusion that the concept of causation can be treated as basic, and thus as not in need of any analysis in terms of other ideas. But it seems very unlikely that this response can be sustained. For, on the one hand, the fact that something is observable in the ordinary, non-technical sense of that term provides no reason at all for concluding that the relevant concept can be taken as analytically basic: electrons are, for example, observable in cloud chambers, but that does not mean that the term 'electron' does not stand in need of analysis. And, on the other hand, if one shifts to a technical sense of 'observation' that does license that inference - namely, that according to which a property or relation is observable only if it can be given in immediate experience - then, as was argued above, causation is not observable in that sense.

Another possible singularist response is that advanced by C. J. Ducasse, who attempted to show that causation could be analysed in terms of relations which Hume granted are observable in the individual instance - the relations, namely, of spatial and temporal contiguity, and of temporal priority. Thus, according to Ducasse, to say that *C* caused *K*, where *C* and *K* are changes, is just to say:

1. The change *C* occurred during a time and through a space terminating at the instant *I* at the surface *S*.
2. The change *K* occurred during a time and through a space beginning at the instant *I* at the surface *S*.
3. No change other than *C* occurred during the time and through the space of *C*, and no change other than *K* during the time and through the space of *K*.<sup>11</sup>

But this proposal cannot be sustained. One problem with it, which Ducasse himself discusses, is that causation is not just a relation between the totality of states of affairs existing during some interval, and terminating at some surface at some instant, and the totality of states of affairs beginning at that surface and at that instant, and existing throughout some interval. Causation is a relation that holds between different parts of two such totalities. Thus, to use Ducasse's own illustration, if a brick strikes a window at the same time that sound waves emanating from a canary do so, one wants to be able to say that it is the brick's striking the window that causes it to shatter. But this is precluded by Ducasse's analysis.<sup>12</sup>

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<sup>11</sup>C. J. Ducasse, 'The Nature and the Observability of the Causal Relation', *Journal of Philosophy*, **23**, (1926), 57-67, and reprinted in *Causation and Conditionals*, 114-125. See p. 116.

<sup>12</sup>*Ibid.*, 122. Ducasse thought he could get around this difficulty, but as Ernest Sosa and others have shown, Ducasse's response is unsatisfactory. See, for example, Sosa's discussion in the introduction to *Causation and Conditionals*, 8-10.

Ducasse's account is open to a number of other objections. Is it not logically possible, for example, for there to be spatiotemporal events which are uncaused? And is it not possible for there to be immaterial minds that have no spatial location, but who can communicate with one another "telepathically"? Ducasse's account appears to exclude such possibilities. The objection that I wish to focus upon here, however, concerns the question of whether there can be causal action at a distance - i.e., whether two events that are separated, either spatially, or temporally, or both, can be causally related even if there is no intervening causal process that bridges the spatial and/or temporal gap between the two events. Ducasse's account implies that causal action at a distance is logically impossible. But is that really so?

Ducasse's account is by no means the only one which entails that causal action at a distance is logically impossible, since Hume's own account, for example, has precisely the same implication. But other, more recent accounts of the concept of causation - such as Wesley Salmon's - also involve the idea that gappy causal processes are logically impossible.<sup>13</sup> But though this idea has been embraced by various philosophers, it seems clearly untenable. For, as I have argued elsewhere, one can surely imagine, for example, a world where the laws governing the transmission of light waves entail that light particles will exist only at some of the places along the line of travel. Insert a mirror at certain points, and the light ray would be reflected. Insert it at other points, and there would be no effect at all. Nor would there be any other ways of intervening at those points which would interfere in any way with the transmission of the wave.<sup>14</sup>

My reason for mentioning this objection to Ducasse's analysis is that the fact that discontinuous causal processes are logically possible adds force to Hume's objection to a singularist conception of causation. To see why, consider the responses that can be made to Hume's argument. Two possible replies have already been mentioned, and rejected - the response, namely, that causation is itself a directly observable relation, so that the whole idea that an analysis is needed is wrong, and the response that causation *is* just succession plus contiguity, contrary to what Hume contends. But if neither of these replies is satisfactory, what, then, is left?

One idea is to uncover what Hume himself failed to find - that is, some further observable property or relation. It is at this point that the possibility of discontinuous causal processes is relevant. For while the situation does not seem very promising if one assumes, with Hume, that there cannot be any spatial or temporal gap between a cause and its effect, it surely looks

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<sup>13</sup>Wesley Salmon, 'Theoretical Explanation', in *Explanation*, ed. S. Korner, (Oxford: Oxford University Press 1975), 118-43. See pp. 128ff.

<sup>14</sup>A more extended discussion can be found in *Causation*, 235-6.

desperate indeed if an event at one time can cause an event at a much later time, in a remote part of the universe, with no intervening causal process. If causal situations can be as unconstrained as this, what observable relation - beyond that of temporal priority - can possibly hold between two causally related events?

The prospects for a singularist account of causation may well seem hopeless at this point. It may seem that, if one is to find an account of causation, one *must* look beyond a given pair of causally related events. But if causation is simply a relation between two individual events, this possibility is precluded. It would seem, therefore, that a singularist conception of causation must be rejected.

This conclusion is, however, mistaken. To see why, one needs only to get clear about precisely what the Humean argument establishes. In the first place, then, it shows, I believe, that causation is not directly observable in the relevant technical sense, and therefore that it cannot be a primitive, unanalysable relation between events. In the second place, it makes it at least immensely plausible - especially when one considers the possibility of radical causal gaps - that causation cannot be reduced to observable properties of, and relations between, individual pairs of events. These two conclusions, however, do not suffice to rule out a singularist conception of causation. For one possibility remains: the possibility, namely, that causation is simply a relation between individual events, but one that is neither observable, nor reducible to observable properties and relations.

Hume's line of argument therefore requires supplementation, if a singularist conception of causation is to be refuted. Specifically, one must either show that there is something special about causation, which makes it the case that only a reductionist account will do, or else one must defend the completely general thesis that all properties and relations are either observable, or else reducible to observable properties and relations. But neither route seems at all promising. For as regards the former, the problem is that there just do not seem to be any arguments of that sort, while, as regards the latter, the thesis that there are no theoretical properties or relations at all is not tremendously plausible in itself, and the arguments that have been offered in support of it all seem to appeal, either openly or covertly, to some form of verificationism.

The conclusion, accordingly, is that a Humean argument does not refute a singularist approach to causation. It shows at most that a singularist account needs to be combined with the view that causation is a theoretical relation between events.

Should an advocate of a singularist account of causation be troubled by this conclusion? Not if the arguments advanced in section 1.2 are correct. For those arguments are not only arguments in support of a singularist conception of causation: they are also arguments against any reductionist

approach to causation, and indeed, more powerful ones, since a reductionist approach to causation is incompatible with *both* singularist accounts and intermediate accounts of causal relations.

The case against a reductionist approach to causation does not rest, however, simply upon the arguments advanced in section 1.2. For, as I have argued elsewhere, there are other very strong reasons for holding that no reductionist account of causation can be tenable, and reasons that are *completely independent* of whether a singularist account of causation is correct.<sup>15</sup>

In a passage quoted earlier, Anscombe says that contemporary philosophers, in holding that causal relations presuppose laws, are guilty of dogmatic slumber. Now even if she were right in thinking that philosophers were slumbering here, the characterization of that as 'dogmatic' would not be fair, since the most that would be involved would be an assumption which philosophers had not in fact examined, rather than one which they were unwilling to examine. But, as the discussion in the present section has shown, Anscombe is not right on this matter. For the idea that a singularist account of causation is untenable is not an assumption that philosophers have made without any supporting argument. There is an argument, and one that goes back to Hume's discussion. It is, moreover, an argument that is very difficult to resist, *unless* one has a viable account of the meaning of theoretical terms - something that, in addition to being unavailable to Hume, has become available only in this century.

It is true, nevertheless, that there is an unexamined assumption that is endemic in the philosophy of causation, but Anscombe has misdiagnosed its location. For, rather than its being the idea that causal relations presuppose causal laws, it is, instead, an assumption that Anscombe herself shares with those whom she criticizes - the assumption, namely, the causal relations, rather than being theoretical relations, are either themselves observable, or else reducible to other properties and relations that are.

My argument in support of the preferability of a singularist account involved three main points. First, supervenience accounts of causation must be set aside, since they are exposed to decisive counterexamples. Secondly, other things being equal, singularist accounts of causation are preferable to intermediate accounts, since the latter necessarily involve a more complicated ontology. Thirdly, the Humean objection to singularist accounts - an objection that may initially appear very strong indeed - turns out to rest upon an unexamined assumption, and one which, I have argued elsewhere, will not stand up under critical scrutiny - the assumption, namely, that causal relations are reducible to non-causal properties and relations.

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<sup>15</sup>*Causation*, especially 247-50.



