curiously reinforced it. For he himself assumed that NECESSARY CONNECTION is an essential part of the idea of the relation of cause and effect,[4] and he sought for its nature. He thought this could not be found in the situations, objects, or events called 'causes' and 'effects', but was to be found in the human mind's being determined, by experience of CONSTANT CONJUNCTION, to pass from the sensible impression or memory of one term of the relation to the convinced idea of the other. Thus to say that an event was caused was to say that its occurrence was an instance of some exceptionless generalization connecting such an event with such antecedents as it occurred in. The twist that Hume gave to the topic thus suggested a connection of the notion of causality with that of deterministic laws—i.e. laws such that always, given initial conditions and the laws, a unique result is determined.

The well-known philosophers who have lived after Hume may have aimed at following him and developing at least some of his ideas, or they may have put up a resistance; but in no case, so far as I know,[5] has the resistance called in question the equation of causality with necessitation.

Kant, roused by learning of Hume's discovery, laboured to establish causality as an a priori conception and argued that the objective time order consists 'in that order of the manifold of appearance according to which, IN CONFORMITY WITH A RULE, the apprehension of that which happens follows upon the apprehension of that which precedes . . . In conformity with such a rule there must be in that which precedes an event the condition of a rule according to which this event INVARIABLY and NECESSARILY follows.'[6] Thus Kant tried to give back to causality the character of a *justified* concept which Hume's considerations had taken away from it. Once again the connection between causation and necessity was reinforced. And this has been the general characteristic of those who have sought to oppose Hume's conception of causality. They have always tried to establish the necessitation that they saw in causality: either a priori, or somehow out of experience.

Since Mill it has been fairly common to explain causation one way or another in terms of 'necessary' and 'sufficient' conditions. Now 'sufficient condition' is a term of art whose users may therefore lay down its meaning as they please. So they are in their rights to rule out the query: 'May not the sufficient conditions of an event be present, and the event yet not take place?' For 'sufficient condition' is so used that if the sufficient conditions for X are there, X occurs. But at the same time, the phrase cozens the understanding into not noticing an assumption. For 'sufficient condition' sounds like

[4] *Treatise of Human Nature*, i. 3, sects. 2 and 6.

[5] My colleague Ian Hacking has pointed out C. S. Peirce to me as an exception to this generalization.

[6] *Critique of Pure Reason*, bk. ii, ch. 2, sect. 3, second analogy.

'enough'. And one certainly *can* ask: 'May there not be *enough* to have made something happen—and yet it not have happened?'

Russell wrote of the notion of cause, or at any rate of the "law of causation" (and he seemed to feel the same way about "cause" itself), that, like the British monarchy, it had been allowed to survive because it had been erroneously thought to do no harm. In a destructive essay of great brilliance he cast doubt on the notion of necessity involved, unless it is explained in terms of universality, and he argued that upon examination the concepts of determination and of invariable succession of like objects upon like turn out to be empty: they do not differentiate between any conceivable course of things and any other. Thus Russell too assumes that necessity or universality is what is in question, and it never occurs to him that there may be any other conception of causality.[7]

Now it's not difficult to show it prima-facie wrong to associate the notion of cause with necessity or universality in this way. For, it being much easier to trace effects back to causes with certainty than to predict effects from causes, we often know a cause without knowing whether there is an exceptionless generalization of the kind envisaged, or whether there is a necessity.

For example, we have found certain diseases to be contagious. If, then, I have had one and only one contact with someone suffering from such a disease, and I get it myself, we suppose I got it from him. But what if, having had the contact, I ask a doctor whether I will get the disease? He will usually only be able to say, 'I don't know—maybe you will, maybe not.'

But, it is said, knowledge of causes here is partial; doctors seldom even know any of the conditions under which one invariably gets a disease, let alone all the sets of conditions. This comment betrays the assumption that there is such a thing to know. Suppose there is: still, the question whether there is does not have to be settled before we can know what we mean by speaking of the contact as cause of my getting the disease.

All the same, might it not be like this: knowledge of causes is possible without any satisfactory grasp of what is involved in causation? Compare the possibility of wanting clarification of "valency" or "long-run frequency", which yet have been handled by chemists and statisticians without such clarification; and valencies and long-run frequencies, whatever the right way of explaining them, have been known. Thus one of the familiar philosophic analyses of causality, or a new one in the same line, may be correct, though knowledge of it is not necessary for knowledge of causes.

There is something to observe here, that lies under our noses. It is little attended to, and yet still so obvious as to seem trite. It is this: causality

[7] 'The Notion of Cause', in *Mysticism and Logic*.

consists in the derivativeness of an effect from its causes. This is the core, the common feature, of causality in its various kinds. Effects derive from, arise out of, come of, their causes. For example, everyone will grant that physical parenthood is a causal relation. Here the derivation is material, by fission. Now analysis in terms of necessity or universality does not tell us of this derivedness of the effect; rather it forgets about that. For the necessity will be that of laws of nature; through it *we* shall be able to derive knowledge of the effect from knowledge of the cause, or vice versa, but that does not show us the cause as source of the effect. Causation, then, is not to be identified with necessitation.

If *A* comes from *B*, this does not imply that every *A*-like thing comes from some *B*-like thing or set-up or that every *B*-like thing or set-up has an *A*-like thing coming from it; or that given *B*, *A* had to come from it, or that given *A*, there had to be *B* for it to come from. Any of these may be true, but if any is, that will be an additional fact, not comprised in *A*'s coming from *B*. If we take 'coming from' in the sense of travel, this is perfectly evident.

'But that's because we can observe travel!' The influential Humean argument at this point is that we can't similarly observe causality in the individual case.[8] So the reason why we connect what we call the cause and what we call the effect as we do must lie elsewhere. It must lie in the fact that the succession of the latter upon the former is of a kind regularly observed.

There are two things for me to say about this. *First*, as to the statement that we can never observe causality in the individual case. Someone who says this is just not going to count anything as "observation of causality". This often happens in philosophy; it is argued that "all we find" is such-and-such, and it turns out that the arguer has excluded from his idea of "finding" the sort of thing he says we don't "find". And when we consider what we are allowed to say we do "find", we have the right to turn the tables on Hume, and say that neither do we perceive bodies, such as billiard balls, approaching one another. When we "consider the matter with the utmost attention", we find only an impression of travel made by the successive positions of a round white patch in our visual fields . . . , etc. Now a "Humean" account of causality has to be given in terms of constant conjunction of physical things, events, etc., not of experiences of them. If, then, it must be allowed that we "find" bodies in motion, for example, then what theory of perception can justly disallow the perception of a lot of causality? The truthful—though unhelpful—answer to the question: How did we come by our primary knowledge of causality? is that in learning to speak we learned the linguistic representation and application of a host of causal concepts. Very many of

[8] *Treatise of Human Nature*, i. 3, sect. 2.

them were represented by transitive and other verbs of action used in reporting what is observed. Others—a good example is 'infect'—form, not observation statements, but rather expressions of causal hypotheses. The word 'cause' itself is highly general. How does someone show that he has the concept *cause*? We may wish to say: only by having such a word in his vocabulary. If so, then the manifest possession of the concept presupposes the mastery of much else in language. I mean: the word 'cause' can be *added* to a language in which are already represented many causal concepts. A small selection: *scrape*, *push*, *wet*, *carry*, *eat*, *burn*, *knock over*, *keep off*, *squash*, *make* (e.g. noises, paper boats), *hurt*. But if we care to imagine languages in which no special causal concepts are represented, then no description of the use of a word in such languages will be able to present it as meaning *cause*. Nor will it even contain words for natural kinds of stuff, nor yet words equivalent to 'body', 'wind', or 'fire'. For learning to use special causal verbs is part and parcel of learning to apply the concepts answering to these, and many other, substantives. As surely as we learned to call people by name or to report from seeing it that the cat was on the table, we also learned to report from having observed it that someone drank up the milk or that the dog made a funny noise or that things were cut or broken by whatever we saw cut or break them.

(I will mention, only to set on one side, one of the roots of Hume's argument, the implicit appeal to Cartesian scepticism. He confidently challenges us to 'produce some instance, wherein the efficacy is plainly discoverable to the mind, and its operations obvious to our consciousness or sensation'.[9] Nothing easier: is cutting, is drinking, is purring not "efficacy"? But it is true that the apparent perception of such things may be only apparent: we may be deceived by false appearances. Hume presumably wants us to "produce an instance" in which *efficacy* is related to sensation as *red* is. It is true that we can't do that; it is not *so* related to sensation. He is also helped, in making his argument that we don't perceive "efficacy", by his curious belief that 'efficacy' means much the same thing as 'necessary connection'! But as to the Cartesian-sceptical root of the argument, I will not delay upon it, as my present topic is not the philosophy of perception.)

Second, as to that instancing of a universal generalization, which was supposed to supply what could not be observed in the individual case, the causal relation, the needed examples are none too common. 'Motion in one body in all past instances that have fallen under our observation, is follow'd upon impulse by motion in another':[10] so Hume. But, as is always a danger in making large generalizations, he was thinking only of the cases where we

[9] Ibid. i. 3, sect. 14. [10] Ibid. ii. 3, sect. 1.