

CAN CAUSE AND EFFECT BE CONTEMPORANEOUS ?

Perhaps no person will seriously maintain that cause succeeds effect and perhaps most persons will seriously maintain that cause precedes effect. Some persons, however, maintain that cause and effect neither precede nor succeed each other, but are contemporaneous.

We shall examine here this last view. The arguments that the advocates of this view advance in support of their thesis can be divided into two types: (a) those derived from perceptual evidence, and (b) those derived from an analysis of the commonly understood characteristics of "cause".

Let us take some concrete causal situations to see whether cause is contemporaneous with effect or not. If an anopheles mosquito bites a man, then the man suffers from malaria. Here the cause "anopheles-mosquito-bite" is earlier than the effect "malaria". If a stone is thrown into the calm waters of some pond, there arise ripples in the pond. Here the effect "ripples" happens later than the cause "stone-throwing". But can the same be said of every causal situation? Mr. Richard Taylor tries to show that cause and effect are contemporaneous by citing some examples. But—in opposition to Mr. Taylor—it is obvious that there is a temporal gap between the motion of the locomotive and the motion of the caboose (when a locomotive is pulling a caboose) or between the motion of the hand and the motion of the pencil (when a hand is writing with a pencil) or between the blowing of the wind and the fluttering of a leaf (when a leaf is being fluttered by the wind) however small that gap may be.

Now, when someone presses the switch-button of a light, light seems to be seen immediately. Do not the two things happen at the same time? Aren't they simultaneous? The reply would be in the negative. For, there is a time-lapse, short as it is, between the two. In some cases like the case of gravitation, it may indeed be asked whether, when a projectile is thrown into the air, gravitation acts upon it immediately or some time later. But in this case it may be replied that gravitation is not an effect of the throwing of the projectile in the strict sense. It is rather a permanent condition guiding the projectile's movement itself and

becomes evident only when a body is displaced from its position of rest.

Thus it seems that there is no clear perceptual evidence to show that cause and effect happen simultaneously. On the other hand, most situations clearly show that cause happens earlier than effect.

But apart from citing perceptual evidence, Mr. Taylor advances two other arguments too in support of his view, and we have to examine them.

Mr. Taylor says that even if "the locomotive does begin moving first, and moves some short distance before overcoming the looseness and elasticity of its connection with the caboose, still it is no cause of the motion of the caboose until that looseness is overcome. When that happens, and not until then, the locomotive imparts its motion to the caboose. Cause and effect are, then, perfectly contemporaneous."² To put his argument in brief, since the moment when we can say with certainty that the cause has wholly (or fully) functioned is also the moment when the effect has already begun, cause and effect are contemporaneous.

It is easily seen, however, that here the conclusion is not warranted by its premise. Mr. Taylor's argument proves not that cause and effect are perfectly contemporaneous, but that there are actual empirical (or technical) difficulties in specifying the last stage of the cause-event and the first stage in the effect-event. Time and any process in time are indefinitely divisible, so that we can never point to or specify the strictly immediate cause. Take the example of the locomotive itself. The motion of the locomotive is said to be the cause of the motion of the caboose. But the motion of the locomotive is imparted all along the distance up to the caboose, and within this intervening distance it might have been arrested or prevented by other intermediate circumstances so that it might not have produced the effect at all. So the last stage in the intermediate series of events should truly be called the cause of the motion of the caboose. Now, until the caboose actually moves, we cannot be sure that the last stage of the cause has occurred. But here we have no longer the cause of the motion of the caboose, but the motion of the

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caboose itself, i. e., the effect itself. So, undoubtedly, it is difficult to state where cause ends and effect begins.

This however is no difficulty in the principle of causation itself but in the practical application of the principle, and it does not prove in the least that cause and effect are contemporaneous. On the other hand, it may be taken as a plausible ground for the view that strictly the true cause of an event is the whole previous state of the universe (or at least a world-segment containing all antecedent circumstances of the causal chain), and the true effect of an event is the whole subsequent world-process (or at least world-segment containing all consequent circumstances of that causal chain).

(2) The second important argument in Mr. Taylor's thesis is that the conditions under which the cause (e. g., the motion of the hand) is sufficient and/or necessary for the effect (e. g., the motion of the pencil which is being grasped by the hand) are precisely those conditions under which the effect is also sufficient and/or necessary for the cause. The relations of necessity and sufficiency are "identical both ways". Hence, according to Mr. Taylor, cause and effect are contemporaneous.

But here also, exactly this conclusion is not warranted by the premise. In fact, the argument overshoots the mark. If it proves anything, then effect may not only be contemporaneous with cause, it may as well precede cause. And, this latter conclusion is certainly not acceptable to Mr. Taylor.

Let us explain. Cause is defined either as a sufficient condition or as a necessary condition or as both a sufficient and necessary condition of the effect. Thus if p is a cause of q , then p is either a sufficient or a necessary or both a sufficient and necessary condition of q . But logically, if p is a sufficient condition of q , then q is a necessary condition of p since it cannot be the case that p happens but q does not. It is the minimum condition that p and not- q cannot happen. Second, if p is a necessary condition of q , then q is a sufficient condition of p , because if q happens p must have happened. Thirdly, if p is both a sufficient and necessary condition of q , then q also is a necessary and sufficient condition for p .

We can say even more. If we strictly individualise both the cause and the effect, then we shall see that there is a reciprocal relation between them. Malarial conditions, e. g., can cause or give rise to malarial fever only — and not typhoid fever; and malarial fever, when it occurs at all, can be caused only by malarial conditions—and not by typhoid conditions. Similarly, the particular type of death, called arsenic death, can be caused only by arsenic poisoning—and not by being hanged or drowned; and the particular type of conditions called arsenic poisoning can cause only arsenic death—and not any other type of death. So, if cause and effect are stated precisely and wholly, we see that (a) if cause is sufficient for effect, effect is also sufficient for cause, (b) if cause is necessary for effect, effect is also necessary for cause; and (c) if cause is sufficient and necessary for effect, effect is sufficient and necessary for cause too.

Anyway, it remains true that the causal relation, whether symmetrical or asymmetrical, binds both cause and effect in a logical manner so that one's happening or occurrence is dependent upon the other's. From this, unfortunately, the conclusion is drawn by some that cause and effect exist at the same time, i. e., that they are contemporaneous. But this conclusion is really the result of a confusion between "ratio" and "causa", i. e., reason and cause. Though history of philosophy contains examples of such confusion, yet it is pretty commonplace now that though there must be some reason or ground (i. e., logical connection) contained within every causal relation, yet that ground or reason is not identical with causal relation itself. For, if the two were identical, we should be able to infer effect from cause without any reference to experience at all. Again, causal relation holds within an existential situation whereas ground or reason which is expressed by implication holds within a postulational situation. Implicational relation between two events is eternal or, in a sense, beyond time. If there be implication between p and q, then the fact of this implication is true for all time — past, present and future. But more strictly, it is timeless, because to ask, at what time (e. g., at present or in the past or in the future) this fact is true, is to ask a meaningless question. So, it is unintelligible how the cotemporaneity view can derive its support from the implicational relation holding between cause

and effect. And if we can, ad impossibile, derive the conclusion that cause is contemporaneous with effect, why not the other conclusion too that effect precedes cause ? Certainly, there is no logical self-contradiction in maintaining that a later event can cause an earlier one. But is this conclusion acceptable ?

Anyway, we can pursue the matter and ask why we do not hold that effect precedes cause. The common argument is this. Effect which is in the future is yet to be, is up till now non-existent, whereas cause which is present now is existent. How can something which is non-existent cause, i. e., act upon something which is already existent ? But we can retort, how can something which does not exist at all be caused, i. e., acted upon by something which is existent ?

Of course, it can be maintained that effect is not really non-existent, it exists in a latent form already in its cause. If the effect were really non-existent (even latently) in the cause, we must say that the effect arises out of nothing, and must reject the dictum *ex nihilo nihil fit* (out of nothing, nothing comes). Surely, the rejection of this dictum involves important consequences. If nothing can produce something, it can produce everything else too. And ultimately we have to admit—for the common generic nature between cause and effect is denied—that anything can be the cause of anything else. But is it possible to turn a blue colour into a yellow one, or for that matter, to any other colour even by the efforts of scientists and artists ? I cannot definitely say whether the turning of a blue litmus paper into a red one when placed in some acid (and similar other phenomena) is an answer to this question. Anyway, there are other stock examples too. A cloth can be obtained from threads only, not from earth; whereas an earthen jar can be made from earth, not from threads. Why is it so ?

The problem we are discussing, viz., the existence or the non-existence of the cause in the effect has been discussed in great detail by some systems of Indian Philosophy — specially by the Sāṃkhya and the Nyāya in the controversy between “Satkārya-vāda” and “Asatkārya-vāda”; and we cannot hope to settle the matter so easily or in a short space like this. It is sufficient to mention that according to the other view (the Nyāya), really

new, i. e., previously non-existent effects can originate, and that is precisely what is meant by causation; and even if effect could remain in a latent form in its material cause, it must express itself in an actual (i. e., new) form later.

However, the Sāṃkhya theory of causation does not dispute that there *is* a time-lapse between the cause and the effect—cause always preceding effect. The effect here is regarded as a “pariṇāma” or consequence of the cause. But it is obvious that the effect is something new at least formally if not materially. Therefore, if we are to maintain strictly that effect is in no sense new (either formally or materially), we are to hold like the Advaita Vedāntins that the change from cause to effect is not ultimately real, i. e., even the so-called formal change is not real, i. e., it is merely an appearance. Thus the process of causation itself becomes unreal.

So, if we are not to deny reality to the process of causation itself and remain as near as possible to common-sense, we can admit that cause and effect are two different events and that effect was non-existent (at least in some respects) before it came into being. But to admit this is to admit that something existent can cause something so long non-existent. If this is so, then there is logically no self-contradiction in admitting further that something so long non-existent can cause something existent however awkward it may seem.

Thus, though the logical relation of entailment holds truly between cause and effect, it cannot explain why cause should precede effect and not vice-versa. The clue to the explanation is to be found elsewhere, viz., in our usage of the term “cause” itself. By cause we mean an event which happens earlier (and never later) than effect. So it will be meaningless or unintelligible if we use the term “cause” to indicate some event which happens later than effect. But is it merely a linguistic convention or is there anything deeper than this underlying the convention itself? It is easily seen from common usage that whenever we say that p is the cause of q, we mean, among other things, that p can *produce* q. And in reality we can experience this active nature of causation in our volition or the act of willing. In our act of willing we seem to be agents ourselves, it is we

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who produce or bring into being or at least manipulate effects. If this is so, cause must happen earlier than effect and not vice-versa.

Of course, it may be objected that this reason is anthropomorphic or animistic in nature. But we must remember that this is in fact the way in which we understand the concept of causation itself; and so this interpretation is grounded in our understanding itself.

Lastly, Mr. Taylor advances an argument to *prove* that all causes cannot be contemporaneous with their effects. (According to him, only *some* causes, not all, are contemporaneous with their effects). He takes the example of a stone which when thrown into the middle of a pond causes ripples appearing at the shore some moments later. If all causes occur simultaneously with their effects, then here also we should be able to say that the stone's throwing occurs simultaneously with the appearance of ripples—which is emphatically not the case as we directly perceive. If it is said that there are some intervening causal connections between the two, then we should still be able to say that all the intervening causal connections “with both the initial disturbance of the water and the subsequent appearance of ripples at the shore” occur simultaneously. But this also “is absurd” because here also we perceive that the cause and the effect are “temporally separated events”³. So we conclude that here the cause and the effect are not contemporaneous. Hence it cannot be the case that in all cases of causal relation, cause and effect must be contemporaneous.

Unfortunately, Mr. Taylor does not see that this argument is equally applicable to the example supporting *his* thesis too, and is thus suicidal to it. In the examples of the locomotive and the caboose, the hand and the pencil, the wind and the leaf, and so on, the causes *are* temporally separated from their effects respectively—only that the time-gap is so small that it is not easily detectable, though theoretically it is always there. Hence it seems that in no cases can cause be contemporaneous with effect.

As Kant has stressed in the famous Second Analogy in his *Critique of Pure Reason*, the order of time or time-sequence is an essential factor of phenomenal causation. (Kant

does not think that the category of causation is applicable to the noumena.) According to Kant, we can apprehend a manifold only successively—the representation of one part following the representation of another. But successive apprehension does not always mean succession in the manifold itself. If we look at a house, we may begin by looking at the bottom and end at the top, or may begin by looking at the top and end at the bottom, or may begin by looking at the left side and end at the right one and so on. On the other hand, when we look at a ship receding from the shore, we are compelled to see the different positions of the ship in a particular manner and not otherwise. Here the manifold itself is successive. There is succession in the object itself, i. e., there is objective succession.

But what is it that makes succession objective in the one case but not so in the other? It is the fact that objective succession follows a fixed order whereas subjective succession does not, i. e., that the order of the subjective succession is arbitrary or reversible whereas that of objective succession is not. It is this necessary determination in the order of events that makes it objective. The principle of this necessary determination of sequence is the principle of causality which means that the condition of being for every event is contained in that which precedes it. In time, every moment is determined by its preceding moment and we cannot reach a later moment except passing through the moment preceding it. Since events must happen in time, the relative positions of events also are not interchangeable. Hence the sequence of cause and effect is necessarily determined, so that cause must happen earlier and effect later, and not otherwise.

Kant admits that sometimes cause and effect do not seem to be successive but rather simultaneous, i. e., apparently no time-lapse is seen between them. But time-lapse or time-interval is not essential for the causal relation at all. What is essential is only the temporal order (which is nevertheless fixed) between cause and effect.⁴ If time-series is really continuous, it will be indefinitely divisible so that between any two members existence of any number of other members is always possible. Thus the interval might be lesser and lesser until at last it might not be discernible at all. But this does not disprove that causal effect-

ation always covers a certain amount of time however short it may be.

It is relevant here to say something of the two notions of order and continuity. The notion of order itself does not involve any temporal sequence. Members in any series may be ordered spatially, temporally, syntactically, historically etc. as the case may be. And not all of these orders are temporal. Order is a logical notion and, as Bertrand Russell⁵ has shown, it can be defined merely with the help of logical concepts. If any relation between three or more terms possesses the three properties of asymmetricality, transitivity and connectedness, then that relation gives rise to a serial order among those terms. But commonly, immediate succession or consecutiveness is regarded as the relation generating a series. Now though this relation is asymmetrical, yet it is not transitive or connected. Then how can consecutiveness explain order? Because it is possible to derive from the relation of consecutiveness an "ancestral" relation which is not only asymmetrical but also transitive and connected — by the method of "mathematical induction". However, mathematical induction is applicable only to a finite series or at the most only to those infinite series "in which though the total number of terms is infinite, the number of terms between any two is always finite". Hence the relation of consecutiveness cannot explain those infinite series like time-series or some number-series where there are no consecutive terms, i. e., where the number of terms between any two is infinite. To cite one of Russell's examples, in the series,

$$-1, -\frac{1}{2}, -\frac{1}{4}, -\frac{1}{8}, \dots, \frac{1}{8}, \frac{1}{4}, \frac{1}{2}, 1$$

"we have first a series of negative fractions with no end, and then a series of positive fractions with no beginning".⁶ In all such cases, order is generated by the relation of transitivity and not by consecutiveness, because "only such a relation [transitivity] is able to leap over an infinite number of intermediate terms".⁷ But since the causal principle is the principle of order *in time*, causality involves not merely order, but *temporal* order. Hence in the continuity of any causal series, cause and effect can neither happen at the same time, nor can their positions in time be interchanged.

Further, as Russell says in the chapter on "The Axiom of Infinity and Logical Types" in the same book⁸,

"We have no reason except prejudice for believing in the infinite extent of space and time, at any rate in the sense in which space and time are physical facts, not mathematical fictions. We naturally regard space and time as continuous, or, at least, as compact; but this again is mainly prejudice. The theory of "quanta" in physics, whether true or false, illustrates the fact that physics can never afford proof of continuity, though it might quite possibly afford disproof. The senses are not sufficiently exact to distinguish between continuous motion and rapid discrete succession, as anyone may discover in a cinema. A world in which all motion consisted of a series of small finite jerks would be empirically indistinguishable from one in which motion was continuous."

So space and time may be discontinuous instead of being continuous. If they are discontinuous, then we should be theoretically able to specify the immediately preceding circumstance, though in practice the position would remain the same. But in any case, cause would precede effect there too.

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NOTES

1. Vide "The Metaphysics of Causation" in the book *Causation and Conditionals* edited by Ernest Sosa, 1975, pp. 39-43.
2. *Ibid.*, pp. 39-40.
3. *Ibid.*, p. 42.
4. *Critique of Pure reason*, B248 = A203.
5. *Introduction to Mathematical Philosophy*, 1970, pp. 31-32.
6. *Ibid.*, p. 26.
7. *Ibid.*, p. 38.
8. *Ibid.*, p. 140.