

Chapter 1

Every Change Must Have a Cause

Now that we are in a new century, it is time face an overlooked question about the philosophy of the last: why has our use of post-Fregean methods not reduced the amount of paradox and disagreement in philosophy? One answer can be rejected out of hand. The reason cannot be that there is anything wrong with post-Fregean methods in themselves. No one can fault contributions like Tarski's treatment of truth, Craig's theorem, Kripke's semantics of possible worlds, or even Russell's theory of descriptions, considered just as logical analyses. Our problems have always begun when we try to base answers to philosophical questions on these logical advances. Since there is nothing wrong with them on their own terms, our failure to reduce paradox and disagreement by means of them, despite the clarity and rigor Frege made possible, must have its sources elsewhere. It must come from other assumptions that we consciously or unconsciously bring to the table. I do not claim, however, that correcting these mistaken assumptions is a sufficient, only a necessary, condition for reducing paradox and disagreement in philosophy.

Often those assumptions derive from pre-Fregean philosophy. This chapter concerns some that derive from Hume, one assumption in particular and a few others that it spawned. Specifically, this section concerns our belief that we cannot know that what I will call the "principle of efficient causality" (PEC) is a necessary truth. The PEC asserts that every change must have an efficient cause, though many other wordings, such as Hume's "Whatever begins to exist must have a cause of existence" are acceptable. My language will for the most part not be post-Fregean but language that could have been used to refute Hume in his own time. Importantly, for example, I will define necessity in terms of contradictoriness, something's both being and not being what it is, not in terms of possible worlds.

It might appear that causality has been a much discussed topic in recent philosophy. In actuality, we have discussed it very little. Treatments of causality have discussed such logical and epistemological topics as law-like and nonlaw-like universal truths, determinis-

tic predictability, contrary-to-fact conditionals, and modal necessity. I will deal with such topics only after I have analyzed causality. Causality is something ontological, not epistemological or logical; it is a relation of thing to thing, not of thought to thing or of thought to thought.

Our acceptance of Hume's critique of causal knowledge is, of course, the reason why we think that a discussion of causality is first and foremost a discussion of certain kinds of knowledge, with their specific logical properties. Hume may have wanted causality to be something that is epistemically "out there." But his arguments forced him to define causality by *universality* in the sequence of kinds of events: An event of kind F is always followed by one of kind G, or an event of kind G is always preceded by one of kind F. The universality of such sequences is the only thing that saves Hume from saying that *post hoc* IS *propter hoc*. Outside of our concepts, however, there are only individual events of kind F and/or kind G. Universality is a linguistically-constituted object, the relation between individual event X and individual event Y resulting from our seeing that the same predicate, e.g., "F" is true of them, or the relation between individual sequences of individual events resulting from our seeing that predicates "F" and "G" are true, respectively, of the prior and posterior occurrences in sequences of events. In short, universality is a logical concept. And it is not just a logical device forced on Hume's attempt to explain causal knowledge by the finitude of the human mind. The logical relation expressed by "universal" is not just used in Hume's account of causality; it is specifically *mentioned* as the feature that distinguishes his account from what would otherwise be an elemental fallacy.

Again, Hume was forced to unintentionally make causality something epistemically logical by his own arguments. His critique of causal knowledge is multifaceted, but I will not have to deal with all of it. I intend to establish as a knowably necessary truth that every change has an efficient cause; a change without an efficient cause would be a contradictory reality. Our knowledge of that truth follows from our understanding of terms; but the truth concerns a condition holding in reality. It happens to be the case that, contrary to Hume,

the understanding of terms that leads to knowledge of this necessary truth comes from sense experience; and I will try to explain how. However, the important issue is not where the concepts come from but this proposition informing us about reality is necessarily true and knowably so.

1.

Until we are conditioned to think otherwise by our philosophic education, we believe that every change has an efficient cause. Whatever the basis of that belief is, it is not based on an observation that changes always embody universal laws. Our belief in the necessity of causes for change, backward-looking causal connections, is far removed from our observation of regular concomitance. Hume's account of causality is like a prejudice; you have to be taught it.

As children, we learn we can expect to find that a change resulted from a state of affairs brought into existence by a previous change. But children do not believe that all changes have causes as a result of their observing that all changes obey universal laws. In fact, for the vast majority of changes we experience, uncontrolled observation alone does not show that they are instances of universal laws. And when we use controlled observation, we do so because we assume the existence of causal connections; we identify which factors have a causal connection to the phenomena under study by systematically screening out factors that may exist but do not have a causal connection to it. Our belief that changes obey universal laws is a consequence (an effect) of our belief that, since what a change is results from what its cause(s) is, in the absence of interfering causes, a cause similar in the relevant respects (which controlled observation is meant to reveal) will cause a change that is similar in certain respects (see Chapter 2).

Most changes result from situations in which multiple causes, each obeying their own universal laws whether we know it or not, combine to produce individual effects not covered by those laws. At a relatively mature point in my intellectual development I may recognize that everything I see as I look out my window resulted from the combined action of causes

that obey universal laws. But no universal law tells me that there should be a tree at that place on my lawn, that there should be a brown patch of grass three yards to its left, that a robin should be landing on its lowest limb at the same time that a dog starts barking, that the sky behind the tree should be cloudless today, and so on. Our daily experience is composed of such unique events, events we find to fall into patterns only after considerable reflection and/or investigation. Yet we believe that the changes bringing such states of affairs about have causes well before we have sufficient experience or have reflected sufficiently on experience to discern enough patterns for our belief that every change is caused to be explained by our belief that events obey universal laws. So the concept of cause employed by our belief in the existence of causes cannot be that of regular concomitance. And the reason that we undertake investigations that will later yield regular patterns is that we already believe that there are causes for those investigations to find.

Until we are conditioned to think otherwise by our philosophic education, we believe that every change has a cause? What, if anything, is the basis of that belief, since it is not based on the observation that changes universally embody universal laws? When their belief in the necessity of causes is challenged, students of philosophy sometimes reply with an argument like the following. A billiard ball is capable of beginning to move at an infinite number of times and is capable moving in an infinite number of directions at an infinite number of speeds. There must be a "reason" why the ball began moving at this time and with this velocity, since infinite other times and velocities were possible, and that reason must be something other than what the ball's being what it is. Something other than the ball must explain why the ball began moving at this time in this direction at this speed, since what the ball is is compatible with all other beginning times, speeds, and directions as well.

The informed teacher will answer that indeed something other than the ball must explain the ball's motion, if we assume that the ball's motion needs an explanation. But that is the point under dispute. Why must there be any

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explanation or reason for the ball's motion, where "explanation" and "reason" mean a cause of some kind. The teacher will grant that, if a ball's beginning to move at this time with this velocity or that needs a cause, the ball is not that cause, if its nature is equally compatible with all other beginnings and velocities. But the teacher will not grant that we know a ball's motion needs any cause.

More than that, the informed teacher will argue not only that we do not know that a cause is necessary the ball's motion, but also that we *cannot* know this. Necessity has to be shown by showing by the contradictoriness of the opposite. Contradiction affirms and denies that a thing is what it is, that A is not A. But when we deny the existence of a cause, we are not denying that A is A, we are denying the existence of something than A. A's identity with itself can show us only that when A exists, A exists. To deny the existence of something other than A is not to deny that A is A. But when we deny the existence of a cause of A we are, by definition, denying the existence of something other than A.

That is what the Hume's critique of the demonstrability of "Whatever begins to exist must have a cause of existence" seems to show:

The foregoing proposition is neither intuitively nor demonstrably certain.... As all distinct ideas are separable from each other, and ...as the ideas of cause and effect are evidently distinct, 'twill be easy for us to conceive any object to be non-existent this moment and existent the next, without conjoining to it the distinct idea of a cause or productive principle. The separation, therefore, of the idea of a cause from that of a beginning of existence...is so far possible, that it implies no contradiction nor absurdity.<sup>1</sup>

There is nothing in any object considered in itself which can afford us a reason for drawing a conclusion beyond it.<sup>2</sup>

A cause of X is supposed to be something distinct from X, since X's need for a cause is supposed to be the need for something other than itself. The necessary is that whose oppo-

site implies a contradiction. But contradictions are affirmations and denials of the same, not of the distinct; they deny something's identity with itself, not its connection to what is other than itself. It appears, therefore, that no contradiction in X's lack of a cause can be known intuitively or by demonstration from what is known intuitively. Thus it is a *necessary* truth that the PEC cannot be "epistemically necessary," that is, known by us to be necessarily true by the only methods open to us of knowing that a statement is necessarily true.

2.

There is a fallacy, however, in Hume's argument. Consider the following circumstance: Something, S, undergoes change Q, an instantaneous or noninstantaneous change, that S was not previously undergoing. From this description we know that S is something really distinct from Q, since S once existed without Q's existing. We also know that Q is related to S such that Q would not exist without S; a change undergone by something would not exist unless the thing that undergoes it exists. A similar change could exist, but it could not be a change undergone by S, if there is no S.

Since it would be contradictory for there to be a change undergone by S that was not undergone by S, we know that between distinct realities Q and S there is necessarily a connection such that if S does not exist, Q does not exist. That is precisely the kind of connection Hume says cannot be known, a necessary, contradiction-implying connection between things that are nonidentical. In replying to Hume, then, we can say that there is a necessary causal connection between A and B, if A and B are nonidentical and A cannot exist without B. (And "cannot" means that if A exists and B does not, then something both is and is not what it is — A is not A or B is not B, etc.)

We just begun to discuss causality, but already we know that Hume was wrong to argue that the fact that cause and effect are, by hypothesis, distinct realities prevents us from knowing any necessary connection between them. Hume's argument was against the very *possibility* of causal connections being knowably necessary. However, *ab esse ad posse* is valid reasoning. So before having a philosophical demonstration of any other necessary

causal connections, we can know that we cannot rule out the possibility of others a priori. Hume's argument against the possibility of epistemically necessary causal connections is already null and void.

I will call an effect's relation of "not-existing-without" a cause a relation of "dependence."<sup>3</sup> Logical devices such as "If A does not exist, B does not exist," "A would not exist without B." "A cannot exist without B." etc. allow us to know truths about necessary causal connections but do not discriminate between the different kinds of conditions that can make those statements true. That is, statements like "A cannot exist without B" and "If B does not exist, A does not exist" could refer to a causal connection either in the effect-to-cause direction (from the dependent to the depended on) or the cause-to-effect direction (from the depended on to the dependent). In fact, three different kinds of connection can satisfy such statements; there are three possibilities for a necessary causal connection: B does not exist without A, since A is a necessary cause of B; A does not exist without B, since B is a necessary effect of A; A does not exist without B, since A and B are both necessary effects of the same cause. In the S-undergoing-Q example, "does not exist without" refers to an effect-to-cause connection, since S previously existed without Q. (If S can exist without Q, Q is not a necessary cause of S, nor are S and Q necessary effects of the same cause; so since it is also true that Q cannot exist without S, the necessity is in the effect, Q, to cause, S, direction.)

A thing's relation of dependence is a relation of needing something, of requiring something, other than itself. For any such relation there must be something other than the thing that satisfies, fulfills that requirement.

The causal connection between Q and S is not the type Hume had in mind. He was thinking of "productive," that is, efficient causes. Mainly as a result of Hume, philosophers today use the word "cause" almost exclusively for efficient causes. But Hume's argument would exclude other connections that have been called "causal" in philosophical literature and, incidentally, are still called that in ordinary usage. In Aristotle's terminology, that

which undergoes a change is a "material" cause, where "material" is not used synonymously with "physical" but in the sense of what something is made out of. If clay is the material out of which a statue is made, clay is the material cause of the statue and of the changes that brought the statue into existence. Today, we still often call the material a thing is made out of a cause. What caused that statue to be so easily breakable? Its being made out of clay rather than granite. To avoid any issues associated with Aristotle's theory of "prime" matter, however, I will not use "material cause." Instead, I will call that which undergoes a change its "subject-cause" or "subjective cause" since that which undergoes a change is still sometimes called the subject of the change.

But ordinary language is not the question here. What is in question is whether there can be a necessary connection between the really distinct. That is what a "causal" connection is from the standpoint of Hume's argument against such connections being epistemically necessary. So a change occurring to something it has not always been occurring to is a causal connection in the sense covered by Hume's argument, though Hume obviously failed to notice that. The connection between a change and the subject of change is a counterexample to Hume's claim that nonidentity, otherness, between things excludes the possibility of our recognizing that an effect-to-cause connection, dependence, is necessary. Certainly, nothing excludes the possibility that, whether we know it or not, what some reality is involves a relation to some other reality such that if the second does not exist, the first does not exist.<sup>4</sup> And in the case of a change occurring to something, nothing excludes the possibility of our knowing that what one reality, the change, is involves a relation to another reality, the subject of change, such that if the subject does not exist, the change does not exist.

3.

Now consider the case where there is something, A, distinct from either the change or the subject, such that it is contradictory for A to be what it is and for the subject to



remain what it is. Then, what A is and what the subject is without the change would together be causes of the subject's changing. To see how it could be contradictory for something to remain what it is when something distinct from it is what it is, assume that billiard ball A rolls until it hits stationary billiard ball B. Assume also that both balls have, as a matter of *contingent* fact, one of the properties we usually associate with them, the property of not occupying the same space as the other, wholly or partially, at the same time. From what A and B are hypothesized to be, it follows that when A hits B, another change must occur; something must cease being what it is in some respect and become something else in that respect. Call ball A's changing of place change 1. In the imagined circumstances, A's contact with B is a situation in which another change, call it change 2, must occur.<sup>5</sup> When that contact occurs, it is contradictory for both A and B to remain what they are in all respects. At least one of them must cease being what it is, in some respect, and become something else.

For example, at the contact, A may simply cease moving and remain where it is. If so, A has ceased to be a thing in motion relative to B; A ceases to be what it is in that respect. Or A may bounce off B, in which case A ceases to be a thing moving in one direction and becomes something moving in another. But if A neither stops nor changes direction, B must begin to move. If so, B has ceased to be something at rest relative to the surroundings it shares with A; it ceases to be what it is in that respect and becomes something else, something in motion. We can, of course, imagine A continuing to move in the same direction but passing through B "magically." In that case, B would not cease being something at rest, but we would not have eliminated another change required by the first. For we assumed that A and B have the property of not being able to occupy the same place at the same time. For A to pass through B, that characteristic must change; so change 2 would be the change from their not being able to occupy the same place to being able to do so.

If a second change did not occur in this situation at least one of the things in the

situation would both be and not be what it is. Specifically, if neither A nor B changes, A both is and is not what it is. By hypothesis, A is something moving in the direction of B's space and something unable to occupy the same space as B. And it is contradictory for motion in a certain direction to exist and not exist at the same place, here, the place where A and B make contact, at the same time. If B does not get out of A's path by beginning to move (or by shattering, or by some other kind of change), A is either no longer moving in the direction of B's space or no longer something that cannot occupy the same space as B. In either case, the assumption that a second change does not occur would require us to hold that A both does and does not possess at least one of its properties. So for one or more subsequent changes not to occur would contradict the hypotheses.

The fact that necessity of a subsequent change follows from this description of A's change of position is a counterexample to Hume's further claim that the nonidentity between things excludes the possibility of our recognizing that a causal connection in the cause-to-effect direction is necessary. Of course, we know from empirical science that at least two changes will occur, equal and opposite to each other, but without knowing that we could know that at least one change must occur. And notice that science is constantly constructing concepts of what things are, concepts like mass, energy, force, velocity, direction, momentum and acceleration, such that it would be impossible for one thing to remain what it is when something else is what it is, as expressed by concepts like these. To believe that causality is really a matter of the *logical* relation of universality holding between kinds of sequences, rather than of a connection between what one reality is and what another reality is, is to believe in magic. The reason why believing that the noise "hocus pocus" will be followed by a particular kind of result is believing in magic is precisely that *what* the noise "hocus pocus" *is* has nothing to do with *what* the result *is*. And why should it not sometimes be the case that, given that something is what it is, something else cannot remain what it is? Or better, how can it not sometimes be the case that, given what something, like moving ball A, is, something else, like stationary ball B, cannot remain what it is?

And why should it not be the case that the universality of a given truth about sequences is an *effect* of this *cause*: the concerned things being what they are?

I will call causes that cannot exist without their effect's occurring "sufficient" causes, and causes that can exist without their effect's existing insufficient causes. If a change has sufficient causes, therefore, when those causes come into existence, the change must occur. The billiard ball example shows that a prior change can bring about a situation such that, given that the things in the situation are what they are and are related to each other as they are in the situation, at least one of the things cannot remain what it is. If that situation exists and another change does not occur, something is and is not what it is. When such a situation occurs, a sufficient cause or causes of the second change exist. The sufficient causes are *things* such that, given what they are and the relation they have to each other in the situation, the situation could not exist without something else coming into existence.

Of course, the same things, balls A and B, could exist but not be in the relation to each other that requires something to undergo a change. In that case, we can say sufficient causes of the change exist but sufficient *conditions* do not, the causes being things, the conditions being a relation holding between things, for example, A's contact with B. The first change, then, brought into existence sufficient conditions for the second change. It brought into existence sufficient conditions for the second change by making one of the causes, A, something other than it was (something moving instead of something at rest) and by bringing the causes into a relation with one another (A's contact with B while continuing to move in the same direction) that necessitated the second change.

And of course, a subsequent change may require (and in all normal circumstances does require) multiple preceding changes to things in order to bring into existence a condition sufficient for the occurrence of the subsequent change. It is only for the sake of simplicity that I have expressed the PEC using the singular "an efficient cause" for what a change that has not always been occurring requires. When I refer to "a cause" in contexts that do not clearly call for the singular, please read "or causes." Likewise, I will not distinguish

causal things from causal conditions except where the context calls for it. The important thing is that both the thing(s) and condition(s) are *causal* with respect to a change, that is, something non-identical with the change such that if one of them exists without the other, at least one of them both is and is not what it is.

So far, the analysis has described causal connections in terms of necessity, but the analysis does not exclude contingency in the connections between causes and effects. A's being in motion at a certain place requires a subsequent change. But although A's motion requires a subsequent change, the subsequent change is contingently related to A's motion. In our hypothesis, A's being in motion at that place would not require a subsequent change unless B was occupying that place. If B were not in that place, A could move through it without requiring a subsequent change. And A could be what it is, a thing in motion through a certain place, without B being in that place. Nothing is contradictory about A being what it is and B not being in that place. So the subsequent change is contingently related to A's being what it is. The subsequent change is not contingently related to the entire set of causal conditions happening to be what it is, but can be contingently related to any element or any collection of elements in that set of conditions short of the entire set itself. They might each exist without B the subsequent change occurring.

4.

The billiard ball example of a subsequent change being made necessary by a prior change does not tell us which of an infinity of possible subsequent change(s) must occur. Since at least one change must occur, however, assume that the change of B's going from being at rest to being in motion occurs. Empirical science, for instance, tells us that under normal circumstances, if nothing other than gravity and inertia is holding ball B in place and it is struck by a ball of equal mass moving at, say, 30 miles per hour, ball B cannot remain what it is with respect to being something at rest. It must cease being something at rest and become something in motion. And the occurrence of its ceasing to be what it is in this respect derives from something else, the ball that strikes it, being what it is, a certain mass

moving at a certain speed in a certain direction at a certain place.

On the other hand, empirical science also tells us that, if instead of billiard balls A and B, a bowling ball moving at 30 miles per hour struck a robin's egg, the subsequent change would be the egg's breaking apart and collapsing, not its rolling away. For the scientist, causality is *not* the logical relation of universality between what two changes are but an extra-logical connection between *what one individual reality*, like a billiard or bowling ball rolling at a certain speed, *is* and what another individual reality, like another billiard ball or a robin's egg, *is*. The connection is extra-logical since, given what each reality is, the connection is that of the real existence of one of the "what"s being required by the real existence of the other, on penalty of at least one of the realities both being and not being what it is.

The present analysis of causality, however, will leave aside what we know about change from empirical science, except for the pedagogical purpose of illustration; the arguments will not depend on empirical verification. For instance, we know from empirical science that A's "action" on B requires an equal and opposite action of B on A, but nothing in the hypotheses we have stipulated would tell us that. What our arguments have shown so far about causality and what the remainder of the arguments will show is capable of being known prior to the empirical parts of science, that is, prior to any particular knowledge verified by the experience of contingent events. But the arguments are not prior to experience since all the concepts the argument has used and will use are drawn from experience. The experience from which these concepts are drawn includes knowledge of contingent events, but no such events are what verify the results of the arguments.

As a preliminary definition, adequate for the arguments to follow, I will call the "efficient cause" of a change something distinct from the change and its subject whose existence requires the potentially changing subject to actually change. A more specific definition would both be irrelevant to my arguments and defeat a very important part of the value of knowing that an efficient cause as so defined is necessary. Efficient causality works very

differently when a joke causes us to laugh, news of a death causes us to grieve, knowledge of premises causes knowledge of the conclusion, a magnet moves an iron filing or one ball's striking another causes the second ball to move, etc. One value of the PEC is that it tells us there is some other cause to look for in each case without (a priori) putting more than minimal limits on what to find when we look. Calling this definition preliminary does not imply that we need to find a better definition to cover all cases, though that might be worth doing, only that it is preliminary to more specific, and differing, information we can obtain in each case of change by pursuing consequences of the general law that every what-this-change-is is brought into existence by a situation brought into existence by *some* previous change(s).

A final preliminary point. Any change brings into existence new state of affairs that might remain in existence after the change. In fact the existence of an instantaneous change is simultaneous with, because it is identical with, the first moment of existence of some new state of affairs. If every change has causes, those causes are also causes of the state of affairs resulting from the change. For if sufficient conditions for a change cannot exist without the change occurring, they cannot exist without the existence of the new state of affairs the change brings about. But once an agent produces an instantaneous change that puts a body in a state of inertial motion, the continuous change does not require an efficient cause to keep it in existence. Why not, if every change needs an efficient cause? An efficient cause would be needed further only if there were a further change; so if the body does not undergo any further change with respect to either its velocity or direction, it does not need further efficient causality for the continued existence of its inertial motion. A change in its velocity or its direction change, however, would call for further efficient causality. Inertial motion is an unchanging feature acquired by an instantaneous change, while acceleration (or deceleration) is a change with respect to an otherwise unchanging feature. So acceleration needs an efficient cause. (For more on causality and the continued existence of the result of a change, see section ??.)

Why we consider inertial motion an unchanging feature and acceleration, even at a constant rate, a change with respect to an otherwise unchanging feature is significant. Nozick criticized Harré's claim that every change must have a cause on the grounds that Harré did not provide a criterion for what is a change and what is not.<sup>6</sup> In fact, scientific knowledge proceeds in the opposite way; we use causality as a criterion of change. We judge inertial motion to be an unchanging feature because we know that change needs a cause, and there is no cause to be found for a body's continuation in inertial motion. If we had found that no cause is necessary for acceleration at a constant rate, we would consider a constant rate of acceleration an unchanging feature. As it is, we know that all instantaneous changes and all changes, whether constant or varying, in an ongoing acceleration have an efficient cause.

But the fact that any instantaneous change has an efficient cause is epistemically necessary; we can know that its falsehood would imply that something both is and is not what it is. In contrast our knowledge that changes in acceleration have efficient causes is empirical. So the demonstration of the PEC will concern only instantaneous changes. The PEC tells us that instantaneous changes from rest to acceleration must be caused and that instantaneous changes from one constant velocity to acceleration or deceleration must be caused. But could we not conceive an acceleration at a constant rate as something that continues in existence without any additional causality, the way motion at constant velocity continues in existence? To the extent that the rate was constant, the acceleration would be something unchanging and not covered by the PEC. This is another possibility which we cannot rule out prior to an investigation leading to *empirical verification*, verification logically (as opposed to psychologically) depending on (caused by) knowledge of contingent truth gained by (caused by) experience. But before we knew empirically that constant acceleration requires continuous causality, the PEC would tell us that the instantaneous change beginning a new rate of acceleration must be caused. The PEC requires an efficient cause for the beginning of a state of affairs, when that state of affairs comes from a change

in a previous state of affairs.

And by empirical verification, we know that, in fact, bodies do not maintain constant velocity with no further causality, since the universe is an environment of forces of acceleration and deceleration. So we find that, were it not for the presence of other accelerating and decelerating causes, the motion billiard ball A causes in B would be a constant state remaining in existence after B's instantaneous change from being at rest to being in motion. But we acquire knowledge such that it is the presence of other causes that prevent B's motion from being a constant state by looking for causes on the basis of the belief that instantaneous changes must be caused (and I will argue below that *verifying* the results of such research also presupposes the PEC). The results of looking for causes of change will refine our knowledge that they must exist but do not contradict it. For the causes of instantaneous change by that fact are causes of any continuous result of the change.

5.

Although I have not yet replied to Hume about the epistemic necessity of an efficient cause, we now know that the question is no longer, as expressed by Hume, whether a cause (some cause) is always necessary. Now the question is whether the subject-cause is the only cause necessary. Can the causality of that which undergoes a change, the change's subject, be the sum total of the causality necessary for the occurrence of the change?

a) Argument I: If the subject of a change is its only cause, a change is dependent on a necessary cause but does not require sufficient causes. A cause of change provides some condition(s) necessary for the existence of the change, that is, conditions such that if the change occurs without them, something both is and is not what it is. But if the subject is the change's only cause, all a change's necessary causes can exist without the change occurring. If a change has "sufficient" causes, on the other hand, when those causes come into existence, the change must occur. I will call causes that can exist without their effect's existing insufficient causes, and causes that cannot exist without their effect's occurring sufficient causes. For if all a change's causes can exist without its occurring, its causes are insufficient



since what comes into existence when it does occur amounts to more than whatever its causes provide it with; for the causes existed already. When the change exists, there is more to its existence than its causes contribute to it. And why can what a change is not be more than what it gets from its necessary causes? In that case, we could say the change is dependent on causes in a certain respect but not dependent on causes to supply all of what it is.

But if Q is dependent on causes with respect to having R, there must be things other than Q sufficient to provide it with R, sufficient to provide that condition for the Q's existence. By hypothesis, if whatever other things are present do not provide a thing dependent on R with R, the dependent thing cannot exist. If a change that has necessary causes in a particular respect must have sufficient causes in that respect. A change that depends on causes for conditions without which it would not exist must have causes sufficient to provide those conditions. If the change did not have causes sufficient to provide those conditions, it would be dependent on causes in a particular respect and simultaneously not be dependent on causes in that respect but in another respect that is necessary but not sufficient for the first. The first would be a condition that is in part supplied, and in part not supplied, by the causes.

So if Q depends on cause X in respect R but X is not sufficient for Q in that respect, Q must also depend on an additional cause, or causes, that together with X is sufficient for Q in that respect. We know that a change occurring to something, S, is dependent with respect to having that to which it occurs as a necessary cause. If that were all we knew about Q and S, we might not get from there to knowing that Q is dependent on any other cause. But we also know that S, the subject to which Q occurs, is insufficient for Q in that very respect; the subject is not sufficient even to provide for the change's need of a subject. S can be and actually has been what it is in all respects other than Q without being Q's subject. Q's having S as its subject is a state of affairs in which what exists is more than what exists when S alone exists. To say the same thing in another way, more exists when S's undergoing Q exists than when S alone existed. So by being what it is, S is not sufficient for the state of

affair's of S's undergoing Q, or of Q having S as its subject-cause, to exist.

Since the subject's being what it is does not itself satisfy the requirement of the change's relation of dependence on a subject-cause, Q requires another cause or causes whose existence, along with the existence of S, is sufficient for Q with respect to the existence of this state of affairs: Q's having S as its subject-cause. With an efficient cause S does satisfy the requirement of Q's relation of dependence on a subject-cause by supplying that to which Q occurs. But S does this, not just by being what it is but by being required to cease being what it is by something else's being what it is.

The reason we know that the change is dependent on another cause than the subject-cause is that we know both that it is dependent in a certain respect, namely, on its subject, and that the subject alone does not provide what it needs in that respect. We get the knowledge that the change would not exist without its subject from the fact that the change is a change occurring to something. But that is not where we get the knowledge that the subject is insufficient for the change with respect to the change's having a subject-cause. We get that knowledge from the fact that the subject was what it is in all respects that make it the subject of the change, except for the change itself, without undergoing the change. So S is not sufficient to be what Q has for a cause in that particular respect in which Q is known to depend on a cause: as having something that undergoes it. Something other than the subject, then, must make up for the subject's insufficiency with respect to the change's need for a subject-cause; something other than S must, together with S, be sufficient to cause the occurrence of S's undergoing Q. This something is what is meant by the efficient cause. Q occurs only if things nonidentical with itself, the efficient and subject-causes, are what they are. (Q could result from a different efficient cause. But if the circumstances were the same in all respects except that this efficient cause did not exist — and so no other efficient cause replaced it — Q would not occur.)

b) In a nontechnical sense of "sufficient" (roughly equivalent to "enough"), the subject can be a sufficient cause of the continued existence of the result of a change, even if

the subject is not a sufficient cause of the existence of the change in the strict sense (a cause that would not exist without the change's existing) in which the change needed a sufficient cause in order to occur in the first place. Every change must begin with an instantaneous change. The result of an instantaneous change can be another state of change, for example, an acceleration, that requires an efficient cause at each moment in order to stay in existence. The result of an instantaneous change can also be a new unchanging feature of the subject of the change. For example, when a body goes from being at rest to being in inertial motion, the change from being at rest to being in motion is an instantaneous change whose existence is the first moment of existence of the ongoing motion (that is what an instantaneous change is, the beginning of the existence of something new). The instantaneous change makes the subject sufficient to maintain the result of the change in existence in the sense that the subject now possesses a feature whose continuing to exist does not require another but whose ceasing to exist would. Until such a further change occurs, the feature exists as long as the subject exists. So the original change was also the beginning of the subject's sufficiency to maintain the result of the change in existence.

Once a prior change,  $Q_1$ , which brings into existence an unchanging feature,  $F$ , has occurred to a subject, the subject is in the same position relative to further change,  $Q_2$ , as it previously was relative to  $Q_1$ . Before  $Q_1$  the subject actually possessed a number of features, but not the feature of undergoing  $Q_1$  or of possessing the result of  $Q_1$ . So before  $Q_1$  the existence of the subject was "sufficient" to maintain in existence unchanging features it had received from changes prior to  $Q_1$ , but not sufficient to be that by which  $Q_1$  is caused. Among the features acquired from changes prior to  $Q_1$  was a feature because of which the subject was a potential possessor of  $F$ ; a potency for  $F$  is just some feature or set of features because of which something that is not now  $F$  can become  $F$ .<sup>7</sup> If  $F$  is an unchanging feature, unlike, say, a process of acceleration, then by hypothesis, once something's potency for  $F$  is actualized, the thing does not require another change to remain  $F$ . Another change of becoming  $F$  could be only occur to something that was merely potentially  $F$ . Since  $S$  does not

require another change to remain F, the continued existence of F does not require a cause other than S. But a cause other than S is required for any change that would put S in a state to which S is now only in potency. So unless there is another change in state, there is no need for a further cause. (What “features” are is not an issue. In the cases we are considering a feature can be extramentally distinct from what an entity having the feature otherwise is, since a change — and so a feature whose first moment of existence is the same as the existence of the change — is nonidentical with its subject. Whatever features are, any complex of really distinct features is nonidentical with any single feature just as a whole is nonidentical with any of its parts. Both an ongoing change and, at the time of its occurrence, an instantaneous change like the beginning of feature F’s existence are features of S distinct from other features.)

When causes sufficient (in the strict sense) for an effect exist, the effect must exist.<sup>8</sup> So someone might even say that S’s sufficiency to maintain the existence of F satisfies our definition of causal sufficiency: As long as S has F, F must exist; so S with F is sufficient to maintain F’s existence. But then it might be objected that if a change can make the subject a sufficient cause of the continued existence of F, nothing prevents the instantaneous change that is the beginning of F from making the subject a sufficient cause of that change. For the existence of the change is identical with the first instant of the existence of F. And since the existence of F makes the subject a sufficient cause of the continuation of F’s existence, why can the first moment of F’s existence not make the subject a sufficient cause of the first moment of F’s existence?

But it is one thing for the subject of F to be the sufficient cause of the continuation of F’s existence; it is another thing for the subject to be the sufficient cause of its own transition from not being F to being F (or from being F to not being F). The first instant of F’s existence is the moment at which the transition from the subject’s not being F to being F exists. The continuation of F’s existence, however, is not the same as the continuation of the transition that existed at the first instant; that instant no longer exists as F continues to

exist.

Once the transition occurs, the subject is a sufficient cause of the continuation of the new state because it is only the *change* in state that the subject is not sufficient for. The subject is not sufficient for its state of not being F to be followed by being F, or for the state of being F to follow the state of not being F. The features other than F that S possesses both before and after Q make S sufficient to be the subject-cause of the continuation of F once F exists. But the subject is not a sufficient subject-cause of the change that is the ceasing to be of what the subject now is.

In fact, S's sufficiency to be a subject-cause, when it has features like F, for the continued existence of those features shows the insufficiency of S to be the subject-cause of the changes that brought features like F into existence. To become a sufficient cause of the continued existence of F means to become something that is only potential with respect to any further change that would be required for F cease to exist. When S is only potential with respect to a further change, S is not sufficient, in the strict sense, to be the subject-cause of that further change. Since a sufficient cause necessitates the occurrence of the effect, if S were sufficient for that further change, that change would occur. Then, S would be sufficient to cause the continued existence of F and the ceasing to exist of F at the same time, and so it would cause both the continued existence of F and the ceasing to exist of F at the same time. So if the subject is a sufficient cause of a continuation of its features, it cannot at the same time be a sufficient cause for a change that would the noncontinuation of a feature.

And prior to the existence of F, S was in the same position relative to a change that would bring F into existence as it is now relative to a change that would make F cease to exist. Therefore S was then insufficient, in the sense required for change, for the occurrence of the change that made S "sufficient" for the continued existence of F. So the subject's sufficiency to cause the continued existence of features like F, after F has come into existence, is identical with its insufficiency to cause the changes that would be either the ceasing to exist or coming to exist of features like F. To be sufficient (in the strict sense) to be

the subject-cause of F's continued existence, S must undergo a transition from not being sufficient to being sufficient. But S is not sufficient to be the subject-cause of that transition. So for S to become the subject-cause of that transition, another cause is necessary.<sup>9</sup>

c) In contrast to a case where a change's only cause would be its subject, consider again the case of billiard ball A hitting another ball (which I will now call ball S), where it was contradictory for both A to be what it is and S to remain what it is and so not undergo change Q. Here, what A is and what S is would together be sufficient causes of S's, the subject's, undergoing Q. Ball S's ceasing to be something at rest is a change that would not exist if S did not exist; so the ceasing to be at rest has a dependence on S. S does not satisfy the requirement of that dependence by being what it is, since S can be and has been what it is without this change occurring. If change Q occurred without the change that brought A into contact with S, Q would be the only difference between the situation in which S was at rest and the situation in which S is in motion. But A's being what it is requires that S cease being what it is, a mass at rest at the same point that A has reached. So change Q is not the only difference between the situation in which S was at rest and the situation in which S is in motion. There is another condition existing at the time of the change which differs from the conditions that existed when S was at rest: A's being in motion at the same place where S, up until now, has been at rest. S's situation now, being in motion, which differs from its previous situation, being at rest, is something without which A's being in motion at that point cannot exist (the definition of a necessary causal connection), where "cannot exist" means that A is not what it is if S does not cease being what it is, and "cannot be without" refers to a connection in the cause-to-effect direction, since the process of change that brought A into contact with S began before the change occurring to S.

So if we posit an efficient cause, a subject undergoes a change if and only if the existence of something other than the change is sufficient for the change to occur to the subject. The change then differentiates the subject as actually from potentially undergoing the change only as a result of the subject and the efficient cause together constituting suffi-

cient causes of which the change is a necessary effect.

Note also that the respect in which Q requires a sufficient cause is for Q's subject to undergo Q. And Q's subject undergoing Q is what it is for Q to exist. So Q is dependent on a cause or causes for its existence, not dependent on causes merely in this or that partial respect, as if the existence of Q could amount to the existence of more than what Q gets from the sum total of its causes, whatever those causes and that sum total may be. For if Q's causes were not sufficient with respect to Q's existence, Q would not be dependent with respect to existence but only with respect to some necessary conditions for existence. So if Q requires a sufficient cause with respect to subject-causality, Q is a complete dependency, a radical dependency: there is no respect in which it does not require a sufficient cause; there is no respect in which it is more than whatever it depends on causes to supply.

At least in the sphere of change, and hence of the results of change, the following intuition is correct: What has necessary conditions must have sufficient conditions. If something has necessary conditions in some respect, the thing must depend on causes in order to exist. And if it depends on causes in order to exist, it cannot come into existence through causes that are less than sufficient to produce the whole thing. Any dependency is a complete dependency; a conditioned thing is a completely conditioned thing. Since any change is a complete dependency, causes for a change must exist such that when those causes have come into existence, the change must come into existence. But when the change's potential subject-cause alone existed, Q did not come into existence. So without an efficient cause, the change requires sufficient causes but does not have sufficient causes.<sup>10</sup>

d) Whose intuition is this? That of almost all philosophers prior to Hume, and of every rational person before and since, starting in childhood, until they are confused by arguments like Hume's. Undergraduates display the intuition when they complain that a ball cannot just start rolling "on its own." And when the philosophy teacher asks why not, they display the intuition when they ask why the ball started rolling at one point in its duration, at one speed and one direction, and not some other. The teacher knows that these answers

presuppose what needs to be shown. But the students presuppose it because, though lacking the tools to say how and why, they can see that a change is a dependency on its subject and so is a complete dependency.

To point out the students' question begging, the teacher might say that S is a cause of Q insofar as Q is a change, but not insofar as Q is this change or that, for example, a change occurring at this point in S's duration not that, or Q is the beginning of a motion with this speed and direction not any others. And the only evidence we have for change's needing a cause is insofar as it is a change, not insofar as it is this change or that. But there is no real distinction between the change and the change's character of being this or that. A change,  $Q_1$ , occurring to S at this time or place, or with this speed or direction, is (or would be) really distinct from change,  $Q_2$ , occurring to S at another time or place, or with another speed or direction. There is no real distinction, however, between  $Q_1$  and the change that occurs to S at this time and place, with this speed and direction.

And what change is is capable of being found in an indefinite number of subject's like S. That is, the state we call "change" in S is similar to the state we call "change" in T. That similarity is extramental; otherwise, the truth condition for "Both S and T are changing" could not obtain. Since change is caused, its explanation must account for, or at least permit, the combination of similarity and difference in one change vis-a-vis another. And a change's possession by its subject is one of the things, at least, that makes a change this change as opposed to that; for one of the things differentiating S's change from T's is the fact that it is S's not T's. The changes of S and T are similar as changes, not as changes of S and T.

And a change occurring to S is a change occurring to something existing at a particular place and time; at other times, S would undergo other changes. Even a change's differentiation by being the start of a motion of a particular speed and velocity has a causal relation to S. Consequently, S has a causal relation to its change's being this change as opposed to that. Q depends on S to be this change at this time, etc., as it depends on S to



be a change. But what S is is not sufficient to cause Q to be this change at this time, etc. S is only a necessary condition for Q to be this change. Since S is necessary for Q in respect to being this change, not that, Q needs a cause insofar as it is this change, not that. S, however, is not sufficient to satisfy Q's need for a cause in that respect; so Q must have at least one additional cause that along with S is sufficient for Q in that respect.

For the sake of argument, however, let us assume that a real distinction between Q's being a change and Q's being this or that change can be made. Direction and speed, for example, that make Q this beginning of motion, not that, would be realities over and above Q and the rest of the motion. Under that assumption, Q would still need a cause in addition to S. The other realities, like direction and speed, are caused in the same way change is; for direction and speed cannot exist without the existence of motion, which, by hypothesis, is something distinct from direction and speed; motion is their cause the way S is the cause of Q. But since motion is capable of infinitely many directions and speeds, what motion is does not cause a direction or speed to be this direction or speed and not that. So within speed, for example, there is a real distinction between that aspect of speed for which motion is the cause and that aspect for which motion is not. But as something of speed, the latter aspect would not exist without the other aspects making speed what it is; and so on. We are in an infinite regress.

There is a more fundamental problem, however, with the hypothesis that Q needs S insofar as Q is a change, but not insofar as it is this change or that.. The reason for hypothesizing that S causes Q insofar as it is a change, not insofar as it is this change, is that what S is makes S capable of infinitely many changes. But what S is also makes S capable of not undergoing any change.. What S is is just as compatible with S's being at rest or in stasus. Therefore, what S is is no more the cause of S's change being a change than it is of S's change being this change or that.

The teacher might take a different tack. Perhaps we should speak, not of whether S causes the change to be this or that change, but of S's being a certain kind of cause for

change. That is, we should say S is a cause of its change insofar as the change needs a subject, and to know that the change is caused by S is to know that the change needs a subject. But what S is makes S capable of being that subject. And when S is the subject needed by the change, it is also the subject needed by any distinguishing features of the change, like direction and speed. Or change might be the immediate subject needed by direction and speed, but change can be such a subject because it has the subject it needs, S. And since the causality of the subject is the only causality that we know is necessary, knowledge of that necessity does not give us a reason for postulating another cause.

But, again, the postulation of the another cause follows from the additional knowledge that what S is does not make S a subject of change, only a potential subject of change. The objection is that our knowledge of a change's need for something other than itself extended only so far as the subject of the change, and what the subject is should therefore satisfy the change's need. The answer is that unless a prior change made what the subject is something that actually, not just potentially, undergoes the change, what the subject is does not satisfy the change's need since the subject's nature was equally compatible with a state of rest or with an infinite number of other changes. If X is a necessary though not sufficient condition for Y, what X is must at least be sufficient for whatever it is that X contributes to Y's existence. But what the subject of a change is is not sufficient for its being a subject of change or a cause of this change rather than that.

3.

The refutation of Hume begins with a recognition that a change requires a kind of causality other than efficient. Argument I derived efficient causality from a change's relation of dependence on its subject. But another prior causal relation is recognizable in change.

a) Argument II: The complex of a change and its subject is a caused reality since it is a complex made up distinct elements, the subject and the change. Any complex has a causal dependence on its elements; the elements are nonidentical with the complex, and the complex would not exist without the elements. Recall that we are using the word

“cause” of a connection between X and something non-identical with itself, Y, such that X would not exist without Y, where “would not exist without” means that if X exists and Y does not, X both is and is not what it is. A complex whole, DE, is identical with neither D nor E; otherwise it would not be a complex. A change, S, and its subject, Q, are causes of the complex of its subject and the change, SQ, in a way analogous to that in which physical parts C and D are causes of the complex, CD.

In the case of a union of things capable of existing apart from each other, we can ask whether their being “united” amounts to anything more than our perceiving them as such. When C and D, which once existed apart, come together, C may not be affected by its being next to D, vice versa. But here the elements are ball, S, and its change, Q. The fact of the ball's being united with the change so as to make a unified whole with it is not something confined to the mind of the beholder. The ball is affected by its undergoing the change, and the change is something-of the ball. Still, the change is non-identical with the ball, since the ball previously existed without undergoing this change. Consequently, SQ is a complex whole causally dependent on its elements.<sup>11</sup>

Notice that even if C and D’s state of being united is entirely something mental, there is an efficient cause for the union; for then a mind is the agent supplying C and D with the relationship of being parts of a whole.<sup>12</sup> From a logical perspective, SQ might be no more than a mereological sum. That is, S and Q are distinct realities that form only a logical unit, distinct realities whose unity consists of the fact that we treat them as a unit conceptually. SQ would not exist without” S and Q, but “would not exist without” can express only a logical connection if the unit in question is only a logical unit.

SQ is something really distinct from S and Q as any complex is distinct from each of the elements of the complex. But a changing subject is not a merely mereological sum of the change and its subject. If it were, the change would not be intrinsic to what the subject is, to the subject’s reality. SQ is not just a logical unit; it is causal unit. The union of the subject and the change is a real relating of distinct factors that by so relating cause the

existence of a new reality, the changing subject, that is a different reality from the reality that existed before, and is different from each of these factors as a whole differs from each of its parts.

In general, it is inductively established causal connections that make the difference between a sum's being or not being a merely logical union. Separated hydrogen and oxygen atoms can be considered a mereological union before they are united in a molecule of water. Induction establishes that the (otherwise merely conceptual) union we call a molecule of water exhibits certain kinds of causal properties that do not exist when the atoms are separated. A merely conceptual union between the physically separated atoms cannot produce the effects that molecules of water produce nor any of the effects that the separated atoms cannot produce. (Or if the merely conceptual union can produce effects that a molecule can, it can produce them only conceptually, not really.) So the union of the atoms in a molecule has an intelligible value, a value for intelligence's goal of understanding what prelogically exists, that is much more than that of being a merely conceptual union. But induction can justify belief in the existence of causes that are more than conceptual unions, only because the justification is based on knowledge that changes must have causes. And one way to acquire that knowledge is from the fact that the union of the change and its subject, is not just a mereological sum but a union involving causal connections.

S is a necessary but not a sufficient condition for the change. The subject is therefore only a necessary and not a sufficient condition for the existence of the complex constituted by its undergoing change. By being what it is, S is only a potential member of SQ, but what is no more than potential does not exist, absolutely speaking. Without the change, the existence of the complex would not obtain, nor would the complex actually have the subject for a cause. So Q is also a necessary cause of the complex.

The existence of the change, however, is the same as its membership in the complex, which is the same as the existence of the complex. For that it is what it is for the change to exist, namely, to be a modification of its subject. (To recognize that a change is

something of its subject is to recognize that its existence is no more than that of a modification of the subject, the existence of something that happens to the subject. The existence of a change is identical with its subject's state of being actualized by the change. There is nothing more to the existence of the change than its actualization of the subject's potency for the change.)<sup>13</sup> Since the effect for which the change is needed, the existence of the complex, is identical with the existence of the change, it would seem that the change is cause and effect of its own existence, a contradiction.

To be caused is to require something other than oneself in order to exist, and the cause must be something that has existence. To have a cause that was not a reality would be the same as having nothing for a cause. What a cause is, in order to be a cause, must include existence. But here the existence of the cause, the change, is the same as the effect, the union of the change and the subject. So either the effect has a nonexistent cause, if the cause is the change without its existence, or the effect is included in its own cause, if the cause is the change with its existence.

The contradiction is avoided only if the change is not a cause of the complex and an effect of the complex in a circular way. Ball, A, in motion with a certain speed and direction at a certain time and place can require that another ball at that place, S, undergo a change. Then S's change, Q, owes its existence, identical with Q's union with S in SQ, to what A is. A, however, is not part of the complex of S's undergoing change Q. Since the change has been caused to exist by something that is not part of the complex of S's undergoing the change, the change can play its role as a necessary cause of that complex without the change's being cause of its own existence. The respect in which the change is a cause of the complex, namely, as a part, neither prevents the existence of the complex from being the same as the existence of the change nor makes the change cause of its own existence. The change can exist as a member and necessary condition for the complex as long as the existence of the change and of the complex derives from something outside of the complex.<sup>14</sup>

The change is one of the elements that an agent can unite to make up the complex, as an agent might pick up C and put it next to D. If we take away the external agent, however, we are left with a change that is cause and effect in the same respect. For the only other element is the subject which is a necessary but not sufficient condition for the change. The subject is therefore only a necessary and not a sufficient condition for the existence of the complex constituted by its undergoing change. And the only other condition for the complex is the change whose existence is the same as its membership in the complex. The presence of the change in the complex causes the existence of the complex, as C's having been moved next to D causes the existence of the complex CD. There is a crucial difference, however, between the way the change is a cause of the existence of its complex and the way C and D are causes of the existence of CD. The existence of CD is not identical with the existence of C or D, which both existed before CD; so neither C nor D causes itself to exist when it causes CD to exist. But the existence of the change is identical with the existence of the complex. Therefore, unless the existence of both the change and the complex is an effect of an external cause, the change does cause its own existence. External cause, A, on the other hand, can cause the existence of the change by forcing S to undergo the change.

So Arguments I and II start from different places but reach the same conclusion: a change is a complete dependency, something dependent for its existence, not just for necessary conditions for existence; therefore a change needs sufficient causes for existence, not just causes necessary but insufficient, for existence. Argument I reached that conclusion from the causal dependence of a change on its subject; Argument II from the causal dependence of a whole on its parts.

4.

We can reach the same conclusion by an argument that make use of the causal dependencies both of a change on its subject and a whole on its parts.

Argument III: There is another way to state how the contradiction of change's causing its own existence can be avoided. The contradiction can be avoided only if the motion is

a cause of its existence by being something that receives existence from another cause; a change's being a cause of its own existence is contradictory unless the change derives existence from an efficient cause. The change can be a cause of its existence only in the sense in which, in the most widely held version of the doctrine of creation ex nihilo, an essence is a cause of its existence. When existence is not, as in God, the thing which exists, existence is the existence of something distinct from itself, that which exists or essence. Thus, an existence that is not the thing which exists is a reality extracognitionally distinct from what exists as a factor that is received by what exists. Such an existence would not occur without something really distinct from itself, the essence; therefore, essence is a cause of existence. But essence's role is only to receive existence, to be actuated by existence, an existence bestowed on essence by another cause. That other cause, God, communicates existence by making something distinct from existence, the essence, receive existence.<sup>15</sup>

Whatever we think of the distinction between essence and existence, or of calling an essence a "cause" of its existence,<sup>16</sup> a change is a cause of the complex of something's undergoing a change and so is a cause of its own existence. A change that receives existence from another is a cause of its existence (the union of the change and its subject) in the sense of something non-identical with the existence without which the existence would not occur. A cause in the sense of something that receives existence from another, however, does not require that what it is, in order to be a cause of existence, include that existence; so the change is not cause of itself contradictorily. The other thing causes the union of the subject and the change by causing the existence of one of the things without which that union would not exist, the change. But if the change causes its existence otherwise than by receiving existence from another, either the effect is part of its own cause, the existing change, or the effect has a nonexistent cause, the change without existence. So it would be contradictory for the change to be a cause of the existence of the change.

Of course, independently of the fact that the change is a cause of the complex, we

can know that the change is a caused reality. For the change would not exist without something other than itself, the subject. And since the subject can exist without the change, the fact that the change would not exist without the subject shows a causal dependence of the change on the subject, not of the subject on the change. Presupposing that the subject is a cause of the change, Argument I asked whether the subject is the sole cause of the change. But another form of that question is pertinent here. We know that the existence of the union of the change with the subject requires that the change is a cause of that union by receiving existence from another. So we need to ask whether the subject can be that from which the change receives existence. If so, no cause other than the change and the subject is necessary for the subject to undergo the motion.

What the subject is, however, makes it only a potential subject of the change and leaves the change only a potential existent; for at one time, the subject existed without the change's existing. Consequently, the subject is a necessary but not sufficient condition for the existence of the change. The existence of the change is the existence of more than what the subject contributes to it. And whatever the change possesses beyond what the subject contributes to the change, call it X, is causal with respect to the union of the subject with the change; for that union could not exist without the change, which includes X. Therefore, in the absence of another cause from which the change receives existence by being united with the subject, the change that includes X contradictorily causes its own existence by causing its union with the subject.

To avoid contradiction, we must recognize that the existence of the change in the subject, and therefore of the complex constituted by the subject's undergoing the change, is caused by something other than the subject. Then, to say that the change is a cause of the union is to say that the other thing brings about the existence of the union by bringing about the existence of one of the constituent elements without which the union would not exist and with which it does exist. If some other thing causes the existence of the change, that thing causes the existence of the complex and causes the change's being a cause of the



complex (that is, causes the existence of the situation in which the complex has the change and the subject as causes), since the existence of the change is the same as the existence of the complex.<sup>17</sup>

Also, in the case of anything, X, distinct from its own existence, causing X requires causing the existence of X. X has been caused if and only if it has received existence, and if something has provided X with existence, there is nothing more that thing need do or could do in order to be the cause of X.<sup>18</sup> Again, a change is a complete dependency, something dependent for its existence, not just for necessary conditions for existence; therefore a change needs sufficient, not just causes necessary but insufficient, causes.

5.

Another argument uses the causal dependence of a whole on its parts, as did Argument II, but establishes directly that a complex is entirely dependent on what is not identical with itself, dependent not just in this or that respect but for existence.

a) Argument IV: The existence of a complex is entirely dependent on the existence of the elements of the complex, which are nonidentical with the complex. The existence of complex, CD, is entirely derived from C and D. "Entirely" means that, by hypothesis, there is no more to what CD is than what C and D contribute to it. "Entirely" does not mean that there are no causes of CD other than C and D. An agent external to CD might, for example, cause CD by moving C into contact with D. Similarly billiard ball A can unite ball S with change Q, yielding complex SQ. But if there are other causes of a complex, they are causes of the complex's elements constituting the whole existence of the complex, causes of the elements being that of which the existence of the complex entirely consists.

So a complex depends on what is nonidentical with itself for existence, not just for necessary, though insufficient, conditions for existence. Are elements like C and D sufficient to give existence to their union? If C and D had been united for the duration of their existence, there might be reason to think so. But what if C and D have not always been united? What if the existence of CD required that either or both C and D underwent a change? Then,

the existence of C and D are necessary but not sufficient conditions for the existence of CD, and some other condition or conditions are necessary that, together with C and D, are sufficient for the existence of CD.

To simplify, let us say that only D underwent the change, call it Q, that brought CD into existence. Further, let us say that Q had not always been occurring prior to the existence of CD and that C was not a cause of the change in D that resulted in CD. If so, even though there is nothing in the present existence of CD that does not derive from C and D, C and D cannot be the sole causes of CD. The existence of CD required change DQ and so required whatever causes DQ required. As a complex DQ is as much a caused reality as CD. There is nothing in the existence of complex DQ that does not depend on what is nonidentical with it, D and Q. So complex DQ requires sufficient conditions for existence, not just necessary but insufficient conditions, since its existence is entirely derived from its what is nonidentical with itself. But are D and Q able to give existence to CQ?

Change Q is not able to give existence to complex DQ without some other cause to give existence to the change. The existence of Q is identical with the existence of DQ, which needs a sufficient cause; so unless another cause gives existence to the change, the change would have to give existence to itself, as we have seen. The other cause from which the change derives existence cannot be D. What D is is compatible with no change or with infinite changes other than the one that brings CD about. So D provides at most a necessary condition for existence, not existence, to the change; the change would have a cause, but the existence of the change would be more than what the cause contributed to the change. And by providing only a necessary condition for the existence of Q, D provides only a necessary condition for the existence of DQ. Without there being something other than D from which the change derives existence, D's undergoing the change is a reality that derives existence from what is other than itself, but there is nothing other than itself able to be that from which it derives existence. The union of the change with the subject must have another condition, a condition not identical with the change or its union with the subject, a condition

that neither the change nor the union causes the existence of.<sup>19</sup>

b) The unavoidably abstract character of philosophic argument can make an argument appear to be unconnected to fundamental intuitions. So let us go back to the student who protests that a billiard ball cannot just start moving. Before any argument, that student knows, or is capable of knowing, that a ball's being in motion is a caused reality, a situation that derives existence from things non-identical with itself. For she knows that the ball's being in motion is a complex whole made up of non-identical elements, the ball and the motion. The student is therefore capable of knowing that the ball's being in motion must have causes able to provide it with existence. For it is contradictory to assert that X exists, that it gets its existence from other things, and that the other things from which it gets existence are not able to give it existence.

Our student is also capable of knowing that a motion is not like the elements of complex CD in that the motion has no existence apart from the complex to which it belongs. And the fact that the motion was not always occurring shows that the ball does not give the motion existence by being what it is; in fact, for the motion to exist, the ball must cease being what it is in some respect. Therefore, our student is capable of knowing that unless there is something else that gives the motion existence, the complex reality is both caused and lacks the causes it needs.

To reinforce the connection of the argument with fundamental intuitions, let us vary the example. States of affairs resulting from change derive their existence from prior states of affairs. That a copy of Hume's Treatise lies where it does on my desk is a caused situation; the situation owes its existence entirely to what is other than itself, its elements. If that situation had not resulted from change, perhaps its elements would have been all it needed to exist. But the situation derived from a prior situation in which the Treatise and the desk existed but not in this configuration. The new situation does not just replace the old with no link to the old other than numeric succession. The new situation is made out of elements of the old and so results from changes undergone by elements of the old.

Since the present situation derived its existence from what existed before, its coming into existence via change was just as much in need of what is other than itself, its elements at least, as is its present continued existence. What existed before was not merely a necessary condition for the situation's coming into existence, as if the situation required conditions but not conditions from which its coming into existence was entirely derived; for the situation owes its existence entirely to what existed before, since it owes its existence to its elements, which existed before. Since its coming into existence derived from what existed before, if what existed before did not provide the situation with existence but only necessary conditions for existence, the situation's coming into existence would be derived and not derived from what existed before. If it owes its existence to what existed before, what existed must be sufficient to be that from which it got existence.

But the element's being what they are did not give existence to this situation; for at one time the elements existed without the new situation coming into existence. What they are made them only potentially members of this situation and left the situation only potentially existing. So the element's being what they are cannot have been all that is necessary for the coming into existence of the situation. The situation's coming into existence must have derived from its elements being what they are and from something other than its elements being what it is, something that together with the elements was sufficient to give existence to the situation.

6.

Like Argument I, the next argument presupposes only the causal relation between a change and its subject.

a) Argument V: It would be contradictory to say that X exists and requires a cause in order to exist and yet has no cause; and since a cause is, by definition, distinct from that of which it is the cause, it would be contradictory for a thing to be its own cause in whole or in part. A thing can depend on an ensemble of multiple causes, but a thing cannot be part of the ensemble of things other than itself on which it depends. But if the subject-cause is the

only thing a change has as a cause, if the change's relation of dependence has only the subject-cause for its term, either a change is caused and has no cause or a change is one of its own causes.

Once we know that a change is caused by its subject, we can ask what is the totality of the causes on which it depends. Call the change Q and its subject S. If S is Q's sole cause, the thing nonidentical with Q without which Q would not occur would be either S when Q is not occurring or S when Q is occurring. If the first, Q needs to have a cause and has no cause; if the second, Q is part of its own cause.

Is it the causality of that which undergoes a change as it exists before the change that is the sum total of the causality necessary for the occurrence of the change? If so, the thing in need of a cause, the change, has no cause. That which undergoes a change is something without which the change would not exist, and so something by which a change is caused, at the time when the change occurs; for if S does not now exist, a change-occurring-to-S does not now exist. But before Q occurs, S is merely potentially that which undergoes Q and so merely potentially that on which Q will depend when Q occurs. Only when the change is occurring does the change actually have something as its subject-cause; for what is merely potential does not yet exist. So if the only cause is S as existing before Q, Q is caused by has no cause. (Again, the occurrence of an instantaneous change, which is the moment when the change needs a cause, is identical with the first moment of the existence of a feature — or ceasing to exist of a feature — that will continue in existence after the change.)

Before the change, the subject could have remained what it previously was for an indefinite period of time. During none of that time would the change have a term of its relation of dependence on a subject-cause.<sup>20</sup> If at any point during that time, the change was related to such a term, the change would have existed at that time. If the change did not exist at that time, the change did not have that on which it actually depended at that time. Since a change has something other than itself without which it does not exist at the time of its actual occurrence, "the only thing a change has for a cause" or "the only thing a

relation of dependence has as the term of the relation" must refer to the subject of the change when it undergoes the change.

But if the sole thing on which the change depends is that which undergoes the change in the act of undergoing the change, the change will be a cause of itself. We know that the change would not exist unless something not identical with it existed, and we are asking what is the *totality* of things not identical with the change without which the change would not exist. By the principle of non-contradiction, we know that the change itself is not one of those things. But if the sole thing "not identical" with the change on which the change depends is its subject in the state of actually undergoing the change, the change is included in its own total cause.

To say that Q depends on something other than itself is to say that it depends on something other than itself being what it is; Q would not exist without the existence of the set of features constituting the reality of something other than itself. But without Q, the features constituting the subject make the subject only potentially what will undergo Q. Q itself is the feature constituting the subject that which Q actually has as a subject-cause. So if Q's happening to the subject is not an effect of some third entity which ipso facto is the cause of the subject's becoming a cause of Q, Q causes itself, since only the fact that Q is one of the subject's features constitutes the subject the total cause of Q. ("Constitutes" does not mean that Q causes the subject to be a cause of Q but that undergoing Q is what it is for the subject to be a cause of Q. For the sake of argument, Argument V is ignoring the causal dependence on complex SQ on parts S and Q. The latter dependence allows Q to be a cause of S's being Q's subject-cause by Q's being a cause of something distinct from itself, complex SQ.)

The occurrence of Q is the occurrence of the subject's not remaining what it is. Without an efficient cause, the only cause of Q, the subject's not remaining what it is, is what the subject is, not what anything other than the subject is. But the cause is not what the subject is prior to not remaining in its previous state. Insofar as the existence of Q

requires the subject to cease being what it was before the change, Q does not derive its existence from what the subject was up to the moment of the change. The only cause is the subject as not remaining in the state that did not include Q itself as part of what the subject is; so Q itself is included in that which Q has as term of its relation of dependence. If there is no efficient cause, Q has a cause only by being included in its own total cause.

Contrast the case in which Q has an efficient cause to the case in which it does not. The example will again be that of billiard ball A, the efficient cause, hitting billiard ball S, the subject, where given what A is S cannot not become other than it is by undergoing change Q. What ball S is prior to undergoing Q and what ball A is are together sufficient causes of S's undergoing Q, without Q's being part of its own total cause or needing a subject-cause but having none. Q, ball S's ceasing to be something at rest, has a causal dependence on S. But ball S can be and has been what it is without this change occurring; so S's being what it is does not satisfy the requirement of Q's relation of dependence. By necessitating ball S's change, however, ball S's being what it is without Q and ball A's being what it is satisfy that requirement.

There is still a sense in which the condition of Q's actually having S as its subject-cause is constituted by Q. But that sense does not deprive Q of a totality of things, which do not include Q as a feature, that are sufficient causes of Q, things other than Q that would not exist without Q's coming into existence. Given that A and S are what they are prior to the change that brings A into contact with S, when A comes to the place where S was previously at rest, S's undergoing Q is necessitated by what A and S otherwise are, that is, by the features other than Q that constitute what A and S then are. Therefore, Q has an ensemble of things that do not include Q as a feature that is sufficient for Q to be caused and so sufficient to be Q's total cause without Q's being part of that total cause. What the subject now is includes Q as a feature, and that fact is identical with Q's actually having the subject as a subject-cause. But since Q's having the subject as its subject-cause is identical with the subject's having Q as a feature, we can just as well say that the-subject's-being-

the-component-cause-of-Q is an effect that has an ensemble of things, A and S as they are without Q, sufficient to require that the subject be Q's subject-cause, without Q's being a feature of that ensemble.

So as a feature of S, Q is always included in its subject-cause and constitutes what it is for its subject to be its subject-cause. But with the efficient cause, Q is not included in S in a contradictory way. For then Q does not constitute what it is for the subject to be its subject-cause in a way that makes Q a part of its own total cause. Remove the efficient cause, however, and either Q has no subject-cause, or Q itself constitutes the condition of its having something, not just as its subject-cause, but as its total cause. And it constitutes what it is for its subject-cause to be its total cause, not just by being an effect of its total cause, but by being the *feature* belonging to its total cause that alone is what it is for Q's total cause to be its cause. In the absence of a total cause that is such by reason of features that do not include the effect, it is only Q's being a feature of the subject — not any other feature of the subject, since the subject had all those other features without Q's occurring — that constitutes what it is for Q to have the subject as its total cause.

But if the subject is not Q's total cause, if it is the subject together with something else *of which Q is not a feature* that constitutes Q's total cause, the fact that the subject is not by itself something Q has for a subject-cause is no obstacle to Q's existence. For Q then constitutes the condition of its subject being its subject-cause *only by Q's being an effect of a total ensemble of causes* that do not include Q as a feature. So with an efficient cause Q constitutes S its subject-cause only by being a necessary effect of what A and S otherwise are.

Absent an efficient cause, if Q was *not* included in its total cause, Q would have to constitute the condition of its having the subject as its subject-cause *only by being an effect of that cause and not by being part of that cause*; but then Q would be caused and have no cause. For just by having the features it has without Q, the subject is not that which Q has as a cause, and so the subject does not have Q as an effect. Either Q is the feature of its



total cause that constitutes what it is for its total cause to be its cause; or Q has a total cause in the features making A and S what they are without Q. If the second, Q is still the feature constituting what it is for its subject-cause to be its subject-cause, but only by being an effect of a total cause that does not include Q itself.

The contradiction of Q's being both cause and effect disappears if and only if there is something other than the change and the subject of the change that, by being what it is, compensates for what is lacking in the causality of the subject; it disappears, in other words, if and only if the subject becomes what undergoes Q as a result of some other thing's being what it is. That other thing, the efficient cause, brings it about that what was only potentially changing actually changes, where "brings it about" means that the efficient cause cannot be what it is without the subject's ceasing to be what it is by undergoing the change. (Magnets and iron filings being what they are, when previous changes have made a magnet something sufficiently close to an iron filing, the iron filing will go from a state of rest to a state of motion.) And by making the subject acquire the characteristic of undergoing the change, the efficient cause brings it about that Q has a subject-cause at the time of its occurrence, without Q's being part of its own total cause or needing a subject-cause but having none.

While it remains true that the subject becomes what Q has for a subject-cause only by undergoing Q, no vicious circle of Q causing itself occurs since Q is not what constitutes its total cause to be its total cause; for Q is caused in the subject by something other than either Q or the subject. Q has a relation of dependence on the subject since, without subject, the agent could not require a change in the subject; Q has a relation of dependence on the efficient cause since, without the efficient cause, the subject would not undergo Q. But subtract the efficient cause and Q has a relation of dependence on itself, since the sum total of what Q has for a cause, namely, what the subject is, includes Q as the characteristic constituting the fact that Q has what the subject is as its total cause. Add the efficient cause, and Q does not depend on itself since the totality of things by which Q is caused is not constituted that totality by Q; for what the efficient cause is and what the subject is without Q are suffi-

cient for Q to occur.

In sum, Q can be what constitutes the subject a subject-cause in ways that are either consistent or inconsistent with the fact that Q has a relation of dependence on a cause. Both with A and without A, Q is included in that which Q has for a subject-cause. But with A, Q is not included in that which it has for a subject-cause in a way that constitutes the fact that its total cause is its total cause. For what A and S are apart from Q constitute a sufficient total cause of Q. We can still say Q constitutes what it is for S to be Q's subject-cause, but only in the sense that the features constituting what A and S are apart from Q make A and S in contact a sufficient total cause of the effect of Q's constituting S its subject-cause. If S receives Q from an efficient cause, Q does not constitute the fact that S is its subject-cause in a way that would either deprive Q of a need for a subject-cause or make Q a cause of itself. So Q does not constitute S its subject-cause in a contradictory way.

A change's relation of dependence on its subject, therefore, is a relation of dependence that does not stop at the subject. It is also a relation of dependence on anything the subject needs for that relation to have a term. Just as a sexually reproducing animal cannot become a parent without the cooperation of the other parent, S cannot be that which Q's relation of dependence has for a term without there being something else cooperating with S by also being something that Q's relation of dependence has for a term. And just as a child cannot have a relation of dependence on one parent unless she also has a relation of dependence on the other, a change cannot have a relation of dependence on its subject without also having a relation of dependence on something other than its subject.

7.

The presentation of Argument V has already replied to the following objections, at least implicitly. But they deserve to be stated and answered, explicitly. These objections arise from recognizing the brute fact that a subject now undergoing a change was not always undergoing that change without looking at that fact from a point of view that allows us to grasp the necessary causal connection that it demonstrably instantiates, and so with-

out grasping the necessary implications of that causal connection.<sup>21</sup>

Why is the truth that S is something by which Q is caused only when S undergoes Q not just a misleading way of stating the trivial truth that S undergoes Q only when it is undergoing Q? Because we know that Q has a relation of dependence on S. Q would not exist without S, but S can exist without Q. The only thing S cannot be without Q is something Q actually has for a cause. If Q cannot exist without having S as a cause and Q alone is what constitutes S that which Q has for a cause, Q is cause of itself.

Or is it just another misleading way of stating the trivial truth that S undergoes Q only when it is undergoing Q to say that if the only cause of the change is its subject at the time of the change, the change is included in its cause? Why could we not say instead that the change's cause is its subject at the time of the change but understood as the sum total of the subject's features *with the exception of the change itself*? If we say, however, that a change has a relation of dependence, at the time of its occurrence, on everything the subject needs in order to be the subject except the change itself, we are really talking about a change that needs a subject-cause and has nothing for its subject-cause. The reason that what S is before Q is insufficient to satisfy Q's need for a subject-cause is that in order to satisfy that need, S must become *other than what it is* in some respect; for that is what happens when S undergoes Q. So, again, if by "the sum total of the subject's features except for the change itself" we were to mean what S is before the change, we would be talking about something that is not and cannot be what Q has for a subject-cause. Insofar as Q is contrary to what S is up to the moment of change, Q does not derive its existence from what S is. But what S is at the time of the change is the same as what S was before the change except for its becoming other than what it was in some respect. So if that S is what we mean by the sum total of what the change has for a cause "except for the change itself," we are really including the change; for we have included S's becoming other than what it was in some respect, which is the same as the change. Either way, the change will wind up needing a cause but having none or being its own cause.

Or is it only a misleading way of stating a trivial truth to say that, if the change only has a cause when the subject is undergoing the change, the change constitutes the subject that by which the change is caused? Since a change needs a cause, a change only exists when it is caused to exist, that is, only when it has a subject-cause. But the fact that a change exists only when it has a subject-cause may mean no more than that a change must be an effect of a subject-cause, which we knew to begin with. So the fact that S is that by which Q is caused only when Q is occurring amounts to no more than the fact that Q has a cause only if that cause, S, has an effect.

But If the connection of Q with S is only that of an effect with a cause, that is, if Q is not included among its own causes, Q needs a cause and has no cause. Q is *something without which S would not be* that which undergoes Q. "Something without which . . . would not . . ." is the definition of a necessary causal connection. It can express a connection of a sufficient cause with a necessary effect, of an effect with a necessary cause or of multiple necessary effects with the same sufficient cause. Here Q is (at least) the effect of necessary cause S. But where Q itself is the only thing nonidentical with S without which Q would not actually have a cause, Q's being something without which S would not be undergoing Q implies more than that Q is an effect of S. If the relation of Q to S is only that of effect to cause, if Q is not one of its own causes, Q has no cause. For just by being what it is, S does not undergo Q; S must become other than what it is to be Q's cause. But the hypothesis of the objection is that it is only Q's happening to S that makes S something Q actually has as a cause. So if it is not true that Q has no cause, Q is cause and effect in the same respect at the same time since Q is included in its total cause as the feature of the total cause that constitutes that cause to be Q's total cause.

The reply to this objection also gives us another reply to the objection against Argument I that if S is not a sufficient cause of Q before undergoing Q, it may be a sufficient cause of Q when in the act of undergoing Q. This way out, of course, merely repeats the error of making Q part of its cause. If what S is was sufficient to be that by which Q is caused, the

fact that S would not be Q's cause without Q (the definition of a necessary causal connection) should mean nothing more than that Q is a necessary effect of the existence of a sufficient cause for Q. Because S by itself is not a sufficient cause for Q, however, the fact that S would not be a cause of Q without Q has to mean something other than that Q is a necessary effect of a sufficient cause. Since it does not mean that Q is a necessary effect of S or that S and Q are necessary effects of a common cause, it means that Q's being caused by S is a necessary effect of Q's being a feature of S. Q constitutes S the sufficient cause of which Q is also the effect. The fact that Q alone would differentiate the state of affairs in which it has a sufficient cause, S, from the state of affairs in which it does not amounts to Q itself being what constitutes S something sufficient to be Q's subject-cause. So in the absence of a prior change in something other than S, a change to which S owes the fact that it is now undergoing Q, Q becomes cause of itself.

8.

A final, brief argument, using some of the vocabulary of Argument V, presupposes only of the causal relation between a change and its subject.

Argument VI: At one time the subject is not changing. So the following is a nonexistent state of affairs: the change's relation of dependence having a term, since the change does not exist. At another time the subject is changing. Now the change's relation of dependence has a term; it has something other than itself without which it would not exist. The opponent wants to say that there is no contradiction in a change's occurring without an efficient cause. So the opponent is implying that the absence of an efficient cause does not make the change a part of its own total cause; for it would be contradictory for a change to be what satisfies its own requirement for having something other than itself without which it does not exist.

Assume, therefore, both that there is no efficient cause and that the change is not part of its own total cause. Another contradiction then emerges: something that needs a cause, since a change cannot exist without its subject-cause, has no cause. For if the

change is the only new factor in the situation, there being no efficient cause, but the change is not part of its own cause, the change still has nothing as term of its relation of dependence. The termination of its relation of dependence amounted to nothing a moment ago when the change did not exist, and the hypothesis implies that nothing happened since then to replace the situation in which there is no termination of a relation of dependence with a situation in which there is a termination of a relation of dependence. The change has happened since then, but

the hypothesis is both that the change itself does not fulfill the requirement its relation of dependence on a cause, the change not being part of its own total cause, and that nothing else that has happened since then fulfills the requirement of its relation of dependence on a cause, there being no efficient cause. The change's not being part of its own total cause means the change itself does not constitute the fact that what it has as the sole term satisfying the requirement of its relation of dependence is that total cause. So if there is no additional cause, a change that is a relation of dependence on a term has nothing satisfying the requirement of that relation; the change is caused and has no cause. Without an efficient cause, on the hypothesis that the change is not part of its own cause, the change has no cause.

To connect this argument with intuitions, let us return to ball A, the efficient cause, ball S, the subject-cause, and change Q. Since what ball A is requires that ball S become something other than it has been, a body resting at the place ball A has reached, Q is not the only difference between the states of affairs of S's being at rest and of S's being in motion. Another condition exists at the time of Q that differs from those existing when ball S was at rest: ball A's being in motion at the point where until now S has been at rest. And this other condition is linked to Q by a necessary causal connection: by requiring ball S's change, A is sufficient for S to become that which the change's relation of dependence on a subject-cause has for a term. Q then differentiates S as what is a term of Q's relation of dependence from what previously was not that only in the sense that S and A together are a total cause

of which Q is a necessary effect and so is a necessary difference between what existed before and now. But if A were removed from the situation, since S is not that which Q's relation of dependence has for a term just be being what it is, Q would differentiate S as what is the term of Q's relation of dependence from what previously was not that in the sense that Q itself is the sole feature of its total cause that constitutes what it is for its total cause to be its cause.

The reasoning of Argument VI gives another reply to the objection against Argument I that though S is not sufficient to undergo Q before it undergoes Q, perhaps S in the act of undergoing Q is sufficient. On the assumption that the change is not part of its own cause, the occurrence of the change does not amount to the fact of what was previously not sufficient to be what Q has for a cause now being sufficient. The subject would change but would still not be sufficient for the change. For it was not sufficient before Q, and the hypothesis both that there is no additional cause and that Q does not satisfy its own requirement for having a cause means that neither Q nor anything else constitutes its being sufficient. On the other hand, if Q did constitute S a sufficient cause of Q, Q would be what fulfills its own requirement for having a cause.

But if ball A cannot be in contact with ball S without S's ceasing to be what it is, A's and S's being in contact fulfill change Q's, need for a cause; they fulfill Q's relation of dependence's requirement that it have a term (or terms). But take A away. If Q still exists, there are two possibilities. One possibility is that the requirement of Q's relation of dependence is still fulfilled. But if so, Q is part of its own total cause; for S does not fulfill that relation just by being what it is. The other possibility is that, though Q exists, the requirement that its relation of dependence have a term is not fulfilled. But if so, Q is caused and has no cause for the same reason: S does not fulfill that relation just by being what it is.

A change, then, either has an efficient cause or is a relation of dependence on a term and at the same time is that which constitutes the fact that what it has as the sole term satisfying the requirement of the relation is what it has as the sole term satisfying that

requirement. If the latter, the change is both an effect and that which causes the effect; it is both dependent and the feature of that on which it depends that makes that on which it depends that on which it depends. Therefore, with and only with an efficient cause, does Q's being what fulfills its subject's potency not make Q what satisfies its own requirement for being caused.<sup>22</sup>

#### Notes

1. David Hume, *A Treatise of Human Nature*,
2. Hume, *Treatise*, p, 126.
3. Refer Harre and Madden, *Causal Powers: A Theory of Natural Necessity*.
4. Nor does anything exclude the possibility of our recognizing that something we know has a specific relation to something else, even if we do not know what that something else is. When a quantity of any number is given in experience, we can know that there is another number to which the first is related as the square root, even if we do not know what that other number is.
5. Assuming that A and/or B remain in existence and are not completely annihilated. Creation ex nihilo and total annihilation would not be changes. What I mean by "change" requires something that undergoes the change and, hence, continues to exist after the change but in a new state.
6. Refer Robert Nozick and Rom Harre.
7. Refer Geach on Ryle, and discuss.
8. see John C. Cahalan, "Making Something out of Nihilation," in *Jacques Maritain: The Man and His Metaphysics*, ed. John F. X. Knasas (Notre Dame: University of Notre Dame Press, 1988), 197-199.
9. Also, as long as F exists, F has a causal dependence on S. That causal dependence comes into existence through a change, Q, that makes S a cause of F's existence. But does Q make S a cause of Q's existence? Then contrary to the definition of cause whose epistemic necessity is in question, Q is cause of itself. (See Section 4.) The first moment of F's existence,



however, can make S a sufficient cause of F's subsequent existence, since in doing so the first moment of F's existence, Q, does not make Q a sufficient cause of itself. If it did, the first moment of F's existence would be, contradictorily, a cause of itself.

10. Refer Yves R. Simon, *Freedom of Choice*.

11. Notice that there must be an efficient cause for a union, even if C and D's state of being united is entirely something mental; for then a mind is the agent supplying C and D with the relationship of being parts of a whole. The behavior of modern philosophers, including Hume, shows that they never ceased believing in the necessity of causes within cognition, only in the primary (causally primary) objects of cognition. Their doubts about our ability to know the necessity of extracognitional existence having a cause have never extended to that case of extracognitional existence which is cognition.

12. Whatever they may say, modern philosophers, including Hume, show by their behavior that they never ceased believing in the necessity of causes within cognition, only within the primary (which itself is a causal notion) objects of cognition. Their doubts about our ability to know the necessity of extracognitional existence having causes have never extended to that case of extracognitional existence which is cognition.)

13. The truth condition of "The change would not exist without the complex" is that the existence of the change is identical with the change's union with the ball. The truth condition of "The complex would not exist without the change" is that the change is one of the constituent elements of the union and therefore a cause of the union.

14. Or if the subject were a sufficient condition for the existence of the change in the way described in the preceding text and in note ??.

15. If the essence were a cause of the existence in any other way than as a capacity actualized by existence received from another, the existence would be caused by essence and yet have nothing for its cause, since without the existence, essence is nothing. Or, if the existing essence is the cause, the existence would be cause of itself, since it is included in its cause. Or, contrary to the hypothesis, the essence would have another existence that was

independent of the existence received. For to say that the existence, or anything for that matter, has a cause is to say that it depends on some reality, some being, other than itself. When we recognize that some reality is caused, we are recognizing that it would not exist without some other reality, not some nonreality. Therefore, the essence cannot contribute more to the existence than the necessary condition of being something that receives the existence from another. But as something that receives existence from another, the essence can be cause of its own existence without contradiction, since the reason its existence would not occur without it does not require that what it is, in order to be a cause, include its existence.

16. Note on the idea that what is at stake is not the verbal definition of "cause". We could apply that word, if we wanted, only to a thing distinct from another thing that gives existence to that other thing. So the other thing would not be a cause of its own existence. Still, the thing and its existence would be realities distinct from one another such that, without the thing, the existence would not be a reality (nor would the thing be a reality without the existence, but here what constitutes "a reality" would be an existence or that which has existence). To put it another way, the thing would still be something distinct from the existence on which the existence depends; for by hypothesis, the existence we are talking about is not itself that which exists. So it requires something other than itself of which it is the existence. It has a relation of dependence on something that receives it. The cash value of this "relation of dependence" is that, were it not possible for there to be something distinct from existence that is actualized by existence, where it not possible for there to be distinct factors, and so distinct realities, essence and existence, God could not create things other than Himself, that is, things in which existence was not that which exists.

17. In addition to speaking of the existence of Q and the existence of S we can, of course, speak of the existence of SQ. Since the existence of Q is the same as SQ, we could appear to be speaking of the existence of the existence of Q. Although that formula would be at least apparently pleonastic, there would be nothing wrong with it grammatically. And as

long as the grammatical correctness of the apparent pleonasm does not mislead us into thinking that the "existence of SQ" is a something more than conceptually distinct from the existence of Q and so from SQ itself, there would be nothing wrong with that formula philosophically. When we speak of the existence of Q, there is no need, as far as the present argument is concerned (but see n. ?? on complexity requiring a distinction between essence and existence), to postulate an ontological *tertium quid*, distinct from S, Q or their union, called the existence of SQ.

Language alone might not so mislead us. But what can make it appear that a *tertium quid* is present is that, since we are distinguishing that which exists from its existence, we would find reason to also distinguish S from its existence. In that case, there would indeed be a three-element complex ontologically: SQ would consist of Q, S and the existence of S. But this would not alter the fact that the existence of SQ is not a *quartum quid* distinct from the union of Q with the two-element complex consisting of S and the existence of S. (To avoid awkward formulas of the "existence of the existence" ilk, I have sometimes used formulas such as "existence obtains," "occurs," "happens," "is the case," etc., where any redundancy, merely apparent or otherwise, is only implicit.)

18. Recall that we are using the word "cause" of a connection between X and something non-identical with itself, Y, such that X would not exist without Y, where "would not exist without" means that if X exists and Y does not, X both is and is not what it is.

19.

20. In fact, the relation of dependence is identical with what the change is. See section ??.

21. That point of view is the ontosophical as opposed to the empirical point of view. See Ch. ??.

22. For further discussion of see John C. Cahalan, *Causal Realism: An Essay on Philosophical Method and the Foundations of Knowledge* (Lanham, MD: Rowman and Littlefield, 1895).