

*Meeting of the Aristotelian Society, at 21, Gower Street, W.C.1,
on April 19th, 1926, at 8 p.m.*

XI.—KANT'S FIRST AND SECOND ANALOGIES OF EXPERIENCE.

By C. D. BROAD.

FIRST ANALOGY.—The enunciation of the First Analogy is slightly different in the First and Second Editions of the *Critique*, but I think that the proposition which Kant professes to prove may fairly be stated as follows: "All perceptible events are just occurrent states of perceptible continuant things. And these things have a quantity which can neither be increased nor diminished by natural causes." Kant appears to identify this quantity with mass. We may dismiss the second part of the proposition at once. For Kant thinks that it follows from the first part, and he gives no independent argument for it. Now it is quite certain that nothing of the kind does follow from the proposition that all empirical events are states of empirical substances which can neither come into being nor cease to exist in the course of nature. All that can legitimately be deduced from this is that the *number* of ultimate empirical substances in nature is constant. It does not follow that any of these substances has a magnitude of any kind; or that, if it has, this magnitude must be constant throughout time for each substance; or that this magnitude, though variable for each substance, must always sum up to the same total when all empirical substances are considered.

To this I think Kant might have made the following answer: "It is not enough that all empirical substances should *in fact* be permanent. In order for experience to be possible we must be able to *recognise* this permanence. And this is possible only

if each empirical substance has some perceptible magnitude, such as mass, which is conserved in amount." This answer, however, will not do. For (a) people did manage to date events in time and to distinguish between the subjective order of their sensations or images and the objective order of perceived or remembered events before they had recognised any magnitude, such as mass, to be conserved. Hence the latter cannot be necessary for the former to be possible. (b) The constancy of some perceptible characteristic is no doubt a very important criterion for deciding whether a certain series of events before a certain moment and a certain other series of events after that moment belong to the same substance. But it is never a sufficient criterion. Spatial and qualitative continuity between the two series of events is also important. And the constancy need not be a constancy of *magnitude*. Very often it is constancy of causal characteristics, *i.e.*, of what Mr. Johnson calls "properties" and Mr. Locke calls "powers." So I think that the second part of the First Analogy may be dismissed as a complete failure; and we can now confine our attention to the first part of it. There are two quite different lines of argument, which we will now consider.

First Argument.—I will quote Kant's own words. (*Max Müller*, p. 149, para. 2, to middle of line 13 of the para.) "Our apprehension of the manifold . . . is always successive and therefore always changing. By it alone therefore we can never determine whether the manifold as an object of experience is co-existent or successive unless there be something in it which exists always, *i.e.*, something constant and permanent, whilst change and succession are only so many modes of time in which the permanent exists." Now this is a mere assertion, not a proof. Can we fill it out and make it more plausible?

I think that what Kant wants to prove is that we could not derive the notion of co-existent events from purely successive

sensations unless we regarded the successive sensations as appearances of persistent substances and their states. Let us try to make up an argument on this supposition. Suppose I have a white visual sensation *followed by* a cold tactual sensation. Very often I shall judge that a white event and a cold event *co-exist* or have *co-existed* in nature. What is involved in this? (a) Evidently I must distinguish between my sensations themselves and the events of which they are signs. For, by hypothesis, my sensations are successive and I am basing upon them a judgment of co-existence. (b) I must regard my *present* cold sensation as a sign of an *earlier* cold physical event; or else I must regard my *past* white sensation as a sign of a *later* white physical event. For, if I regarded each sensation simply as a sign of a physical event which is *contemporary* with it, I could not regard the perceived physical events as contemporary when the sensations by which I perceive them are successive. (For the present purpose we may understand by "a white physical event" an event which would manifest itself to any normal person, suitably placed at the time of its happening, by a white visual sensation.)

The question now is: "How can I be justified in regarding a present sensation as a sign of a certain past event, or in regarding a past sensation as a sign of a certain present physical event?" The answer is that I must assume that both sensations are manifestations of states of a persistent something with permanent powers of producing certain kinds of sensation. I must assume, *e.g.*, that my present cold sensation is an appearance of something which not only *does* feel cold now, but which also *would have* felt cold when I was having my white visual sensation if I had then been touching it instead of seeing it. Or I must assume that my past white sensation was an appearance of something which not only *did* look white then, but which *would still* look white now if I were seeing it instead of touching it. I have not the least idea whether this argument would have been accepted

by Kant as what he meant. But it has the merit of being intelligible and of starting from Kant's premises and reaching something like his conclusion. I will now make some comments on it.

(a) The premise that all our sensations are purely successive is plainly false. But it remains true that we do very often claim to perceive *contemporary* events by means of sensations which are *successive*; and the argument can be applied to such cases. I very much doubt, however, whether we could have formed the notion of physical co-existence at all unless we had met with instances of co-existence among *sensa*. It is perfectly true that we do now often regard contemporary sensations as appearances of successive events and successive sensations as appearances of contemporary events. And I think it is true that we do use the notions of Cause and of Substance when we do this; or, at any rate, that we should have to use arguments which involve these concepts if we were called upon to justify our procedure. But we surely should not have formed the concept of Simultaneity at all, with or without the help of Cause and Substance, if from the very first we had been acquainted with nothing but what is successive. (b) Although the argument proves something, it does not prove anything like as much as Kant claims to have proved.—*e.g.*, it has not the faintest tendency to prove that no empirical substances can begin or cease to exist in the course of nature. If I am to regard two successive sensations as appearances of two contemporary events, and if I am to justify myself by this argument, I must indeed assume the existence of an empirical substance which lasts at least as long as the interval between these two sensations. But, so far as this argument is concerned, it might have begun to exist just before the first sensation and it might cease to exist just after the second sensation.

Second Argument.—This begins in the fourth line from the bottom of p. 149 in *Max Müller* and goes on to the end of the

first paragraph of p. 150. It is repeated in the Second Edition, and will be found in *Suppl. XVIII*, p. 773, of *Max Müller*. Kant's statement is, as usual, very difficult to follow; but there is no doubt that this argument differs entirely from the one that we have already considered. I will follow what seems to me to be probably the argument of the Second Edition.

Kant starts by saying that "all phenomena exist in time; and in it alone as the substratum can *simultaneousness* as well as *succession* be represented." (Kant's italics.) I take him to be asserting that when we call two events "simultaneous" we *mean* that they occupy the same moment of Absolute Time, and that when we call two events "successive" we *mean* that they occupy different moments of Absolute Time. His next step is to assert that "Time by itself cannot be perceived." This means, I think, that we cannot perceive moments of Absolute Time, but only events. It follows at once that the *definition* of "simultaneity" and of "succession" cannot be the *criterion* by which we discover whether a given pair of events are simultaneous or successive. This leads to the last step. Since we certainly do manage to judge that certain pairs of events are simultaneous and that other pairs are successive, there must, he says, "exist in objects of perception a substratum which represents time in general, and in which all change or simultaneousness can be perceived through the relations of phenomena to it." I think that this simply means that we must take some perceptible process as uniform, and represent the successive moments of Absolute Time by successive phases of this process. We can then date all other events by considering their temporal relations to the phases of this standard process. If two events be simultaneous with the same phase of the process they are counted as simultaneous with each other. If they be respectively simultaneous with different phases of this process they are counted as succeeding each other. I suppose that Kant thought of this

standard process as the uniform movement of some permanent perceptible body such as a pendulum or a planet. This is probably the reason why he insists that time must be represented by something permanent in phenomena. But, even if this be necessary, it is obviously not sufficient. This permanent something must not be *merely* permanent, or it could not possibly represent time. What is needed is that there shall be a perceptibly uniform process of change—*e.g.*, a regular rotation or vibration, which continually repeats itself. Now uniformity is primarily a permanence not of substance but of the characteristics of a process of change. A permanent substance is needed only in so far as a permanent mode of change requires a permanent substance. So Kant seems to have put his emphasis in the wrong place.

Even so, I certainly cannot admit that this argument could prove anything like as much as Kant claims to have proved. The most that it could prove is that, if all events are to be dated in a single time-series, there must always be *some* perceptible process or *other* which is perceptibly uniform and can be taken as a standard. But it need not always be the *same* process or be going on in the *same* substance. Every individual clock began and will cease to exist, and every clock sometimes stops. But, provided that there are always some clocks going, and that the new ones that are made can be regulated by the old ones before these stop or are broken, we could always date events in a single time-series. Kant seems to think that this would be impossible unless there were some one clock which is always going. But all that is really necessary is that there shall always be some clock or other which is going. He has therefore not proved that there need be even a *single* empirical substance which never began and will never cease in the course of nature. Still less has he proved that *every* empirical event must be regarded as a state of such a substance.

Moreover, it seems to me that the principles which are involved in the second argument are inconsistent with one of the premises of the first argument. And, since both arguments are supposed to prove the same conclusion, this is unfortunate. When we date an event by reference to the phases of some standard process, such as the positions of the hands of a clock, this always involves immediate recognition of the fact that two *sensa* are simultaneous. *E.g.*, if we want to date a certain flash, we have to be immediately aware of the simultaneity of this sensation with the sensation which manifests to us the momentary position of the hands of the clock. Unless different sensations could be, and could be immediately recognised to be, simultaneous with each other, it would be impossible to date other events by reference to the phases of a perceptible standard process. But one premise of Kant's first argument is that all sensations as such are intrinsically *successive*.

Conclusion.—It seems to me obvious that Kant has not proved the conclusion which he set out to prove. I understand this to be that ordinary every-day experience would be impossible unless all perceptible events could be regarded as states of perceptible substances which can neither begin nor cease to exist in the course of nature. And it seems to me almost equally clear that this conclusion is in fact false. Ordinary experience would go on very much as it does now if old substances occasionally ceased to exist, and new substances occasionally began to exist, and there were a certain number of "wild" events which could not be assigned to empirical substances at all. It is all a matter of degree. If such shocks happened too often ordinary experience would cease to be possible. No doubt scientists do assume that the ultimate substances, whatever they may be, neither begin nor cease to exist in the course of nature; and that all physical changes are, or are correlated with, re-arrangements of these ultimate substances and changes in their modes of motion.

And it is arguable that, without this assumption, the strength of their beliefs in particular natural laws "established by induction" would be incapable of justification. Kant hoped to prove that certain very fundamental and characteristic features of ordinary experience could not be explained unless these very rigid assumptions of science were fulfilled. If this could have been proved, it would have been a very important result. But Kant has certainly not proved it, and it is almost certainly untrue.

SECOND ANALOGY.—There appear to me to be three fundamentally different lines of argument by which Kant tries to prove the Second Analogy. The enunciation of the Analogy is slightly different in the two editions of the *Critique*, but I think that the difference is only verbal. I think that the Analogy may fairly be stated in the following form: "Every perceptible event must be regarded as causally determined by some earlier perceptible event in accordance with some general law." We will now consider the three proofs.

First Argument.—This is to be found in *Max Müller*, p. 155, to the end of para. 1 on p. 162. As in the first proof of the First Analogy Kant starts with the *assumption* that all sensations are intrinsically successive, and with the *fact* that we nevertheless sometimes base upon them judgments of co-existence and sometimes judgments of succession. He takes two examples to illustrate this fact: (a) Suppose I look at any large object, such as a house, from such a distance that I cannot get it all into my field of view at once. Then perhaps I first look at the roof and then cast my eye down it till I come to the basement. Or I first look at the left side of it and then carry my eye along till I come to the right side of it. Or, again, I might walk round it, so as to see the sides and the back. Here my sensations are certainly successive. When I am seeing the roof I have not yet seen the basement, and when I am seeing the basement I have ceased to see the roof. Yet I believe that the roof and the base-

ment, the right side and the left side, the back and the front, are all co-existing parts of a single physical thing. (b) Suppose I look at a boat going down a river. My sensations are again successive. But now I judge that I am perceiving a series of successive events, and not simply seeing successively a number of parts which are themselves co-existent. The facts which Kant here illustrates are certainly quite genuine. And it is certainly true that no one who could not draw this distinction between the order in which we happen to get our sensations and the order in which perceptible things and events exist in nature would have an experience in the least like ours. Kant's problem is: "How do we come to be able to make such distinctions, and what is implied in the fact that we can make them?" This is evidently a genuine and important problem; and, so far as I know, Kant was the first person to raise it.

Now Kant points out that there is a fundamental difficulty at the outset. I am acquainted with nothing but my own sensations, and these are intrinsically successive. The very fact that I draw a distinction between the order in which I happen to get my sensations and the order which exists in perceived objects implies that I regard my sensations as signs of something other than themselves. But what can this "something other" be, and how can I know anything about it? Kant says that the notion of Transcendental Objects or Things-in-themselves is here irrelevant, even if it be in fact true that our sensations are caused by such Objects. When a person who casts his eye over a house says that he is perceiving a whole of co-existing parts by means of a series of successive sensations, he is not talking about Things-in-themselves in Kant's sense of that term. We do not know whether Things-in-themselves have parts at all, or whether there would be any sense in supposing that their parts are co-existent. The objects of which our sensations are signs must then differ from the sensations themselves and yet cannot be

Things-in-themselves. What then can they be? Kant's answer on p. 156 seems to be as follows: The empirical object of which a certain sensation is a sign is a whole set of actual and possible sensations connected in accordance with a rule. "What is contained in our successive apprehension is considered as presentation; and the given phenomenon (though it is nothing but the whole of these presentations) is considered as their object. It is with this that my concept, which is drawn from my presentations, has to accord" (p. 156, *line 19 et seq.*). Again: "The phenomenon, in contradistinction to our presentations of it, can be regarded as an object different from them only if it is subject to a rule which makes a certain kind of combination of the manifold necessary" (p. 156, *line 30 et seq.*). This view of empirical objects seems almost identical with Russell's, except that Kant regards *sensa* as mental or mind-dependent, whilst Russell does not. So the concept of a house is the concept of a certain group of actual and possible sensations subject to a certain characteristic rule of connexion. And any sensation belonging to this group will be a presentation of the house or of some part of it.

Having settled what is meant by an "empirical object," Kant now considers the conditions which determine whether a series of successive sensations shall be treated as a sign of a series of successive physical events or as a sign of a set of co-existing parts of an empirical object. Here there are two distinct points to be considered: (a) What is in fact our criterion for objective co-existence and objective succession? And (b) What is implied by this criterion?

(a) In the case of the house, it would have been possible for me to have reversed the order in which I got my sensations without handling the perceived object. Actually the appearance of the roof preceded the appearance of the basement. But, if I had there and then looked in a different direction and cast my eyes upwards instead of downwards, the appearance of the base-

ment would have preceded that of the roof. In the case of the boat floating down the stream nothing that I could have done, short of actually handling and dragging the boat upstream, would have enabled the appearance of its lower position to precede that of its upper position. Put in general terms Kant's criterion may be stated as follows : Suppose that sensation a has in fact preceded sensation b . Then, if I believe that without doing anything to the perceived object I could have made sensation b precede sensation a , I hold that the successive sensations are signs of simultaneous events or parts of an object. If I believe that nothing that I could have done short of interfering with the perceived object itself could have made sensation b precede sensation a , I hold that a is a sign of an event which objectively precedes the event of which b is a sign.

I will now make two explanatory comments on this criterion : (1) Kant does not suggest that in one case the actual order of the sensations is undetermined and that in the other it is determined. He holds that it is determined in both cases. The difference is simply in the mode of its determination. In one case it is determined *by* me, and would have been different if I had chosen to do different things with my body at the time. In the other case it is determined *for* me or *imposed on* me, and nothing that I could have done with my body at the time would have made it different. (2) Kant does not explain why I believe in one case that I could have altered the order of the sensations without interfering with the perceived object, whilst in the other case I believe that I could not. But it is fairly easy to state the grounds for these beliefs. In the case of the house I find that, after having the series $a-b$, I can at will get a series $b'-a'$ in which b' is exactly like b and a' is exactly like a . I find that I *can* do this as often as I like ; and so I argue that I *could have* had the sensations a and b themselves in the order $b-a$, though I actually had them in the order $a-b$.

The next question is whether this criterion is either necessary or sufficient. I think that it certainly is not sufficient. (1) Suppose that at the same place two physical events happened simultaneously, one of which appeared as a flash and the other as a noise. Then whatever I did with my body the flash would precede the noise. I should therefore hold, on Kant's criterion, that the event which appears as the flash objectively precedes the event which appears as the noise. And I should be wrong. So the criterion is plainly insufficient. (2) Suppose, again, that a physical event which appears as a noise takes place at a point P at a time t_P . And let another physical event which appears as a noise take place at a different point Q at a later moment t_Q . Then, provided that the distance PQ is greater than $v(t_Q - t_P)$, where v is the velocity of sound in air, I could make the P-noise earlier than, simultaneous with, or later than the Q-noise merely by moving about to suitable situations. Suppose that P and Q were each sending out a series of sounds at the same regular interval, and that I started by standing in such a position that the P-noises and the Q-noises were simultaneous. Then I should find that if I move in one direction the sensations happen in the order $p-q$, and if I move in another direction the sensations happen in the order $q-p$. I ought to conclude on Kant's criterion that each P-event is simultaneous with a Q-event. But I shall be wrong if I do so. Hence the criterion cannot be sufficient. We may conclude that Kant's criterion of objective sequence or co-existence is undoubtedly useful if checked by other criteria but is certainly not sufficient by itself. A complete account of the subject involves very great difficulties, and would lead us on to the Theory of Relativity. We cannot blame Kant for not having anticipated Einstein; but we can regret that he took no account of the quite elementary difficulties which I have just pointed out.

(b) We now come to the final step of Kant's argument. It seems to me that Kant may have intended to assert either of two very different propositions about causation. I shall therefore state them both, and consider whether either is true. The common supposition of both propositions is that on a certain occasion I have two sensations a and b in the order a - b , that a is a manifestation of the physical event α , and that b is a manifestation of the physical event β . The two propositions may then be stated as follows: (1) If I could not have had the sensations a and b in the order b - a , then the physical event β must have been causally determined by some physical event α' which was contemporary with α . (α' may happen to be identical with α , but it need not, and in general will not, be identical with α .) The other proposition is this: (2) If I have any ground for believing that I could not have had the sensations a and b in the order b - a , then part of my ground for this belief must be the belief that the physical event β was causally determined by some physical event α' which was contemporary with α . It is evident that these two propositions are quite different. We will now consider them in turn.

(1) The first proposition is certainly false. Suppose that β were an entirely uncaused event, and that α objectively precedes it. β , whether caused or uncaused, cannot manifest itself before it has happened. On the other hand, α may manifest itself before β has happened. In that case it is impossible that the sensation b should have preceded the sensation a . Hence the fact that the order a - b of the sensations could not have been reversed does not imply that β must have been caused by something contemporary with α . For this irreversibility could exist even if β were completely uncaused. Let us take another instance. Suppose that α and β were two events which happened at the same place, and which both manifest themselves by noises. Suppose further that α objectively precedes β . Then, even though β

were completely uncaused, the sensation *b* could not have preceded the sensation *a* no matter how I might have adjusted or placed my body at the time. You may say that this example assumes a particular causal law, since it assumes that all sound-disturbances travel with the same velocity. This is true, but irrelevant. The causation here involved is between the physical events and the sensations, whilst Kant is professing to prove that the second *physical event* must have been caused by some physical event which is contemporary with the first. If then Kant did mean to assert the first of the two alternative propositions, he simply made a gross mistake.

(2) The second proposition is a good deal more plausible. In order to discuss it we must first ask: "Under what circumstances should I judge that I could not have had the sensations *a* and *b* in the order *b-a* instead of the order *a-b* whatever I might have done with my body at the time?" The answer seems to be as follows: I should make this judgment under two conditions. (i) It may be that I have often had sensations like *a* and sensations like *b*, and that my body has been *differently* adjusted on each occasion, and yet the sensations have *always* happened in the order *a-b* and never in the order *b-a*. Or (ii) it may be that I have often had sensations like *a* and sensations like *b*, and that they have sometimes happened in the order *a-b* and sometimes in the order *b-a*. But my body has been adjusted *in exactly the same way* on occasions when the sensations have happened in the order *a-b* and on occasions when they have happened in the order *b-a*. (An instance of the first case is provided by lightning and thunder. An instance of the second kind would be provided by watching railway trains, some of which pass me on the up-line and some on the down-line.)

We have now only to consider what is involved in inferring from such facts as these that I could not have had the particular pair of sensations *a* and *b* in the opposite order to that in which

they in fact happened. I can infer immediately from these facts that the particular adjustments of my body at the time when I have a pair of *a*-like and *b*-like sensations are probably causally irrelevant to the order in which such sensations happen. And from this I can infer that in all probability nothing that I might have done with my body on the particular occasion when I had the sensations *a* and *b* would have altered their order.

Now of course this argument does involve the notion of causation. But, so far as I can see, it involves it only negatively. The fundamental proposition assumed by the argument is the following: "Lack of concomitant variation between two factors throughout a *series of instances* is a sign of causal irrelevance between these two factors in *each instance*." It does not involve the assumption that the factor which varies while the other keeps constant, or keeps constant while the other varies is *itself*, causally determined at all. Of course I am quite ready to admit that when condition (i) is fulfilled we should *in fact* suspect a direct or indirect causal connexion between *a*-sensations and *b*-sensations. We should suspect that *a*-sensations intrinsically determine the occurrence of *b*-sensations, or that *a*-sensations are determined by physical events of the α -kind which intrinsically determine physical events of the β -kind, which in turn determine *b*-sensations. Again, when condition (ii) is fulfilled we should *in fact* be inclined to suspect that there are variable factors *a'* and *b'*, such that *aa'*-sensations directly or indirectly determine *b*-sensations, whilst *bb'*-sensations directly or indirectly determine *a*-sensations. But these are just *other* inferences which may be made on *other* principles from the same facts. They are not involved in inferring from these facts that the order of the particular sensations *a* and *b* could not have been reversed by anything that I could have done at the time. So, if Kant meant to assert the proposition (2) it seems to me that he was mistaken. The utmost that he is entitled to say is that the facts from which

people commonly infer that a certain event objectively succeeded a certain other event are the same facts from which they commonly infer that the second event was causally determined by something contemporary with the first event. But, since they use a negative and relatively indeterminate premise about causation in making the former inference and a positive and relatively determinate premise about causation in making the latter inference, we are not entitled to say that the former inference can never be justifiable unless the latter is so too.

Second Argument.—This is to be found in *Max Müller*, p. 164, para. 2, to p. 165, end of para. 2, and also in *Supplement XIX*, p. 774–775. It takes as its premise the fact that I can *perceive* or *remember* that a certain change took place in the order *a-b* and not in the order *b-a*, whilst I can *imagine* it equally well as taking place in either order. Kant rather mixes up the two cases of remembered and of perceived change. I propose to treat them separately, beginning with remembered change.

(a) Suppose I remember that *a* changed to *b*. It may quite well happen that the image of *b* arises in my mind before the image of *a*. So I am able to distinguish between the order in which my memory images happen to arise and the order in which I believe the remembered events to have happened. Again, no matter in what order the images happen to arise I can always think of *b* preceding *a*, although I believe that *a* in fact preceded *b*. Somehow then I manage to distinguish between a merely imaginary and a real order of events. I think that these must be the facts that Kant is referring to in the following passages: “The series of successive presentations may be taken as retrogressive as well as progressive” (p. 164, para. 2). Again, “Imagination can connect these two states in two ways, so that either precedes the other in time” (p. 775, top). What do such facts involve?

Kant first makes a negative statement. I cannot reach the distinction by means of the moments of time themselves at which

the events happened. For, he says: "Time cannot be perceived by itself, nor can we determine in the object, empirically and with reference to time, what precedes and what follows" (*p.* 775, *line* 3, *et seq.*). He then makes his positive assertion. The only possible ground that I can have for believing that *b* objectively followed *a* is that I believe *b* to have been causally determined by something contemporary with *a*. Kant gives no ground for this assertion. The mere fact that we do not draw the distinction in one way is no reason for holding that we do draw it in a certain other way. I shall now try to show that the way in which Kant suggests that we draw the distinction could not suffice to account for the facts, and that there are other criteria which Kant has omitted.

(1) Kant denies that we can discover that *b* objectively follows *a* by appealing to the moments of time which they occupy, on the perfectly reasonable ground that moments of time are not perceptible. But his own criterion is open to precisely the same objection. The characteristic of "being causally determined by something contemporary with *a*" is obviously not a *perceptible* characteristic of the event *b*. No doubt if we accept the Law of Causation we do know of every event (and therefore of the event *b*) that it has the characteristic of "being causally determined by some event which precedes itself." But, unless we already knew on other grounds that *a* preceded *b*, we could not infer from the fact that *b* has the characteristic of "being causally determined by *some* event that precedes *b*" that it has the more determinate characteristic of "being causally determined by some event which is contemporary with *a*." So Kant's criterion, taken by itself, is as useless as the appeal to moments of time which he has rightly rejected.

(2) All that Kant has really established is two negative facts: (i) that it is useless to appeal to the moments of time, since these are imperceptible; and (ii) that it is useless to

appeal to the order in which the images of *a* and *b* happen to occur, since it is admitted that the image of *b* may precede the image of *a* when I firmly believe that *a* preceded *b*. But these facts leave many other possibilities open—*e.g.*, the images might have certain perceptible characteristics, such as degree of liveliness, amount of detail, and so on. I might regard a livelier and more detailed image as in general representing a later event than a fainter and less detailed image. There are almost certainly many signs which we use to judge the objective order of remembered events. Probably none of them by itself is sufficient; and undoubtedly we do in certain cases use a causal criterion among others, after we have established to our satisfaction certain particular causal laws—*e.g.*, if I find that an historian mentions a certain event I conclude on casual grounds that the event objectively preceded his record of it. All that I wish to maintain against Kant is (i) that the general law that every event is causally determined by some earlier event is quite useless for fixing the relative dates of two determinate events *a* and *b*, and (ii) that particular causal laws could not possibly be our *only* or our *original* criterion for dating events in an objective order. For no single law of this kind could have been established unless we had other grounds for dating events, since our only empirical evidence for holding that *x* causes *y* is the observed fact that events of the *x*-kind have always been followed in our experience by events of the *y*-kind.

(b) We need now say very little about the case of *perceiving* a change *a-b* and contrasting it with an *imagined* change *b-a*. (1) Kant altogether ignores the vitally important fact that there are sensations of change as well as changes of sensation. It is only when I have sensations of change as well as changes of sensation that I can strictly be said to *perceive a change*. Otherwise I can only be said to *perceive that something has changed*. When I look at the second-hand of a watch or at a flickering

flame my *sensa* have a peculiar determinable quality which is just as characteristic and just as sensible as colour or temperature. This determinable quality has various determinate forms, just as colour has. If the second-hand of my watch had jumped backward instead of jumping forward while I was looking at it, the determinate form of the determinable sensible quality of movement would have been as obviously different as red is from blue. To say that the perceived change took place in the direction $a-b$, whilst I can imagine it taking place in the direction $b-a$, means simply that my visual *sensa* have a certain determinate form of the sensible quality of motion, whilst I can conceive that they might have had a different determinate form of the same determinable quality. It is surely obvious that this does not involve the belief that b is caused by something which is contemporary with a .

(2) In order that I may perceive *that* there has been a change from a to b without perceiving *the change* from a to b , the following conditions seem to be necessary and sufficient: (i) I perceive b and I perceive something (which may be b itself) which is inconsistent with the existence of a now. (ii) I remember a and I remember something (which may be a itself) which is inconsistent with the existence of b then. Now it is certain that the distinction between remembering and perceiving, and the distinction between remembering and expecting or merely imagining, cannot depend on making judgments which involve causation. It is true that we now often *test* particular memory-judgments by criteria which involve particular causal laws; but no causal law could have been established unless we had already accepted a great many memory-judgments at their face-value and without appeal to causation, and had distinguished them already from mere imaginations or expectations. Perhaps it will be said that causal judgments are involved in judging that the present existence of a is inconsistent with something that I now perceive

and that the past existence of b is inconsistent with something that I now remember. Certainly *if* I remember something contemporary with a which I believe to be the cause of b , I shall judge that b could not have existed then. But (i) this criterion of inconsistency presupposes that certain particular casual laws have already been established; and (ii) it is not the only available criterion of inconsistency. If I perceive that x is now in a certain place and I remember that it was in a different place, I know, without any appeal to causation, that it must have changed its place. Such a judgment does no doubt involve the category of substance, and it does involve the recognition that I am dealing with the same substance on both occasions; but it does not appear to involve the category of Cause, and it certainly does not involve any judgment about the causation of the perceived present event by something contemporary with the remembered past event. It seems to me, then, that Kant's second argument is a complete failure.

Third Argument.—This is utterly different from the other two, but it may be compared with the second argument for the First Analogy. It is to be found in *Max Müller*, p. 162, *para.* 2, to p. 164, *end of para.* 1. The argument seems to be as follows: Consider any pair of events a and b , of which a in fact precedes b . Then we should all admit that, although a in fact precedes b , it is *logically* possible that b should have preceded a . Now consider two moments of time t_a and t_b , of which t_a in fact precedes t_b . We should hold that if t_a in fact precedes t_b , it is *logically* impossible that t_b should have preceded t_a . We are convinced that no pair of moments could have stood in any different relation to each other from that in which they actually do stand. Now the question is: "How do we come to know this fact about moments of time, seeing that they are imperceptible?" Kant answers that we can know this fact about the series of *moments* only because it is represented by a certain property

of the series of *events*. Suppose that every event is causally determined by some earlier event. Then if *b* in fact follows *a* it is *causally* impossible that *b* should not have followed *a*; for *b* is a causally necessary consequence either of *a* itself or of something contemporary with *a*. To put it generally: "If all events be causally determined by earlier events, and we take any momentary total state of affairs as a datum, then it is causally impossible that any of the subsequent states of affairs should have been different from what they in fact are." Kant's argument seems to be that it is only by recognising the *causal* necessity of the actual order of perceptible *events* that we can know the *logical* necessity of the actual order of *moments*. And, since we do recognise the latter, we must recognise the former.

There are two remarks to be made on this argument: (1) Even if we accepted it, it would prove only that we *believe* that every perceptible event is causally determined by some earlier perceptible event. It would not prove that the belief is *true*; and Hume himself would have been quite prepared to admit the existence of the belief. (2) The argument is unsound. We can explain why we believe that two moments *must* stand in the relations in which they do in fact stand without any appeal to the Law of Causation. This I will now show.

When I distinguish between events in time and moments of time, what exactly do I mean? I regard an event as a particular which has some other characteristic beside its determinate temporal position—*e.g.*, it may be a flash of a certain determinate colour and intensity in a certain determinate place. I regard a moment as a particular which has *no* other characteristics except a determinate temporal position and any temporal relations which may be entailed by this. When I say that, although the event *a* in fact preceded the event *b*, it is logically possible that *b* should have preceded *a*, what do I mean? I mean simply that an event which was in all other respects exactly

like b might have had the temporal position which a has, and that an event which was in all other respects exactly like a might have had the temporal position that b has. This is the only sense in which it is logically possible that b should have preceded a , though a in fact precedes b . But in this sense it is plainly impossible that two *moments* should have stood in any other relations than those in which they do in fact stand. For, by definition, a "moment" is something which has no quality but a certain determinate temporal position. Hence any moment which had a different temporal position from t_a would by definition be a different moment from t_a : and similar remarks apply to t_b . It is therefore a purely analytic proposition that two moments could not have stood in any different relations from those in which they do in fact stand. And we do not need to appeal to events and their causation in order to recognise the truth of a purely analytic proposition about moments. So Kant's third argument fails like the other two.

General Conclusion.—Kant may be congratulated on having seen the importance of the question: "How do we date events in a single neutral time-order, and distinguish between the order in which we happen to get our sensations and the order in which the events that we perceive by these sensations happen?" He may be congratulated on seeing that the notions of Substance and Causation are involved in all attempts to carry out this task completely. But this is as far as we can go. His detailed arguments are obscure and confused to the last degree; and when we try to disentangle them we find that they are utterly incompetent to prove his detailed conclusions.
