

# THE NATURE AND VALIDITY OF THE CAUSAL PRINCIPLE

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Causality is a type of organizing principle imbedded within experience and constantly employed in the practical arts of life and in all the manifold ways in which living organisms are said to learn from experience. Causality occupies a preeminent place among the organizing principles which experience makes use of and relies upon as if they were the most certain and obvious features of the things and processes with which all life and experience are concerned. Yet, when reflection supervenes upon life and experience, it is just these categorial, pervasive, structural, and organizing principles which become problematic. Reflection asks for their credentials. They are called upon to attest their validity before the bar of critical analysis and reflective thought. The crucial pungency of the philosophical problem of causality derives from a species of unrest and disquiet which prevail just so long as the principles indispensable for life and experience can find no reasonable basis for their validity. But considerable caution is advisable in formulating both the nature of such principles and the criterion of reasonable validity. Yet the problem remains. What measure of reasonable validity, if any, attaches to the foundations, the basic patterns of life and of knowledge, of the structures and processes which are displayed both in the human scene and in its environment? What happens when the organizing principles actually used in experience, both as theoretical and as practical, become the subject matter for critical reflection?

Experience is prior to reflection in both of the major meanings of priority. In the temporal sense, there is experience before the processes of thought and reflection get under way. Also, experience is logically prior to reflection in the sense that there

could be no subject matter and material for reflective thought were it not for experience. Reflection is, as the word itself tells us, a turning around, a bending back upon something which is pre-reflective, something other than sheer vacuity. What other term can we use for this vast pre-reflective something save the term "experience"? We are to take it in its primarily denotative sense in which it refers to whatever men live through, do and undergo, perceive, suffer and enjoy, plan for and regret, control, manipulate, and appreciate. These are all doings and havings, inseparably linked with things done and had, rich in content and scope, suffused with qualities and meanings, with motion, life, and efficacy, with success and frustration, hope and fear, gladness and sorrow. Here is naïve, "macroscopic experience," "coarse and vital experience," actual experience "charged with history and prophecy." I have borrowed these phrases from Mr. Dewey, and I record my conviction of the important service to philosophy which he has rendered in calling us back to this protean, primitive, and denotative sense of the term "experience." I do this the more eagerly because I am unable to accept the major results to which, as he supposes, the priority of such experience commits us.

I shall use the term "primary experience" to denote that which precedes reflective thought and supplies its material. Primary experience is clearly similar to what Mr. Loewenberg has called "pre-analytical data," and to what Mr. Pepper has called "middle-sized fact." The terms "datum" and "fact" however appear to suggest something more punctual and simple than the term "primary experience" which holds in solution both factual items or data and relational patterns or organizing principles. The distinction between primary and reflective experience has its own hazards and perplexities. It might appear that any attempt to characterize the world of primary experience, to describe its features and contents presupposes the prior adoption of a reflective attitude so that primary experience cannot get itself described from its own non- or pre-reflective standpoint. The hope of so describing it may appear as fatuous as the

attempt to see what darkness looks like by turning on the light. But the simile is too misleading. Primary experience need not be dissipated by reflective thought as darkness is dissipated by light. Indeed, it cannot be so dispersed else there can be nothing to reflect upon and about. I shall not here pause further to track down this affair, but shall assume an ability to discover and discriminate features and aspects of primary experience, and to single them out for reflective consideration.

There are patterns, schemata, and organizing principles present and employed in primary experience. These supply the linkages, the transitions, the concatenations of things by means of which one item of experience is taken to suggest, to imply, and to lead to other items. By virtue of such types of order and relational structure one occurrence is a sign of preceding and impending occurrences, the present is linked to the absent, the near at hand yields a clew to the distant and outlying. Things have potencies and tendencies, enduring natures and habits which elicit and demand plannings and expectations on our part. Primary experience is never a punctual, momentary, and immediate affair. It is characterized by depth, solidity, and massiveness. This far-flung dimensionality is due to the effective presence within primary experience of categorial, organizing principles and relations. The two things here to stress are first, the operative presence within primary experience of such organizing categories prior to their subsequent discovery through reflective analysis, and secondly, the fact that these categorial principles hold of things and events. They are used by primary experience because they belong to the texture of the things and affairs with which primary experience deals. They are quite objective, if one may use an anachronism derived from reflective experience, after what is "objective" has got itself discriminated from the "subjective." Primary experience is, for example, organized in terms of continuant things and their qualities, active agents, means and ends, spatial and temporal orders, causal efficacy, goods to be sought for and evils to be avoided, values to be prized and appreciated, only to name some of the

more obvious and pervasive traits actually found and used in pre-reflective experience. The features of experience denoted by such terms are not, within the framework of primary experience, alien intruders; they are not projected from without into any crude stuff of experience. They are taken to be as much a part of the nature of things as are shapes and colors. They belong naturally to the domestic scenery and surroundings of man's life and activities.

Among the organizing principles of pre-reflective, primary experience, causality occupies a central position. Its importance appears to be due to the part which it plays in our experience as practical. That it has a wider meaning and scope will become evident in the course of the discussion. However, it is the case that in all that men contrive, plan, and manipulate, in all purposive behavior, the orderly potencies and efficacies of things are relied upon and are used. The natures of things are exhibited in the trains of events which they initiate and determine. And not only does man learn to count on the effects of causes whether initiated by himself or by nature. He also infers backwards and outwards from effects to their causes. There is no need to exhibit in any detail the ways in which the principle of causality is constantly employed in primary experience.

But now turn to reflective experience. Inquiry and analysis, thought and reflection, supervene upon primary experience. Men not only live and act, contrive and enjoy; they inquire and they reflect. Reflection directs itself upon some integral feature of primary experience. Some characteristic of that feature elicits reflection. Thought arises from life and experience. What occasions the transition from primary experience to reflection? I shall accept the broad statement that reflection is elicited by some problematic feature of primary experience. Failure, obstruction, collision, contradiction, hesitation, such terms as these may serve to denote what kind of thing it is in primary experience which generates inquiry and reflection. But merely to say this is not enough. There are problems and problems. In particular, I wish to distinguish two kinds of problematic situations and two cor-

responding types of problem and inquiry. This distinction will be seen to have a definite bearing upon the problem of causality. The perplexity may in the first place be focussed in some specific thing or nature, some specific item, term, or context. What is the square root of two, when will the next full moon occur, what are the chemical constituents of this substance, what are the causes of muscular contraction, what will happen if the total supply of currency be increased—these are all specific problems. There is one important kind of specific problem which may be labeled ‘pragmatic.’ It is of this general type. What specifically shall I do, or what specifically is to be done, if a certain result is to be attained? It concerns the *faciendum* of some definite situation. While all pragmatic problems are specific, not all specific problems are pragmatic, though they may well involve pragmatic problems in the inquiries leading to their solution. The question what is the square root of two is a specific problem, but not pragmatic. But the question what shall I do if I want to ascertain the square root of two is a pragmatic question. Now it is to be noted that all specific problems involve the use of some general concept or organizing principle. The question I have just instanced uses the category of number, and of irrational number. The question as to when the next full moon will occur contains the category of time. It is the same with all the others. Are there, now, any significant problems which fall outside the range of such specific and pragmatic inquiries? I think that there are, and in so thinking I part company with Pragmatism. Not only do we inquire into the natures, contexts, and concatenations of specific items. We also inquire into the meaning and the validity of those more pervasive, organizing principles whose presence and use in primary experience has been noted. Such problems may be called ‘reflective.’ Instead of looking for the square root of a specific number, or of solving a particular equation, we now become interested in the nature and the validity of the basic concepts used in specific inquiries. Categories which are employed in pre-reflective experience now become the objects of reflective scrutiny. It is they which have become problematic.

The difference in kind between a specific and a reflective problem becomes apparent when we note that no answer to a reflective inquiry gives us any direct aid in answering a specific question, and vice versa. An illustration will show what I mean. We are interested, in common sense and in science, in making accurate reports and descriptions of things and events. These are the outcome of specific inquiries. But one may be concerned with the question as to what is meant by the predicate "true" which is used or implied in all specific assertions. Now no theory of truth, which is a reflective affair, can be of any help to me in deciding whether it is true or false that three times five is twenty, or as to the truth or falsity of any other specific assertion or hypothesis. Likewise, no answer to the reflective problem as to the nature and validity of memory and knowledge of the past will help me to answer the specific question, did I or did I not lock the front door before coming upstairs. Ethics provides an instructive instance of the same fundamental distinction. It is one thing to ask what I ought to do in such and such specific circumstances. This is a pragmatic question. It is quite another thing to reflect upon the meaning and the validity of the category of obligation itself. A pragmatic problem is prospective and forward looking; a reflective problem arises only when one stops acting, pauses, turns around and wonders whether the course he has been pursuing, whether the instruments and principles he has been using are indeed valid.

The distinction between specific or pragmatic and reflective problems applies to causality. First there is the question as to the specific causal antecedents and consequences of any assignable occurrence. This is a specific problem, and is never remote from a pragmatic problem. Secondly, there is the reflective problem with respect to the nature and validity of the general principle of causality which we constantly use in primary experience and in science. In his *Enquiry*, Hume is concerned chiefly with the question as to the grounds for saying that some specific event is the cause of some definite effect. In the *Treatise*, he raises the question as to the validity of the general causal principle itself.

Here, too, no reflective theory about the nature and validity of the principle of causality will help either the practical man or the scientist to know whether the causes of event E are to be located in A or B or C, or what specific causal sequence must be initiated in order to secure some desired end. The reflective interest in ascertaining the nature and validity of those organizing principles which we do as a fact use in practical life and also in science is different from the interest which generates a specific or a pragmatic problem. Reflective inquiries are sterile and pragmatically otiose with respect to specific and pragmatic inquiries.

The distinction here in question roughly corresponds to the difference between science and philosophy. Mr. Stout has characterized science in this way.

The beginning and end of science are found in the particular co-existences and sequences which are accessible to observation and experiment. The knowledge sought by the man of science is such only as may or might, directly or indirectly, help us to anticipate that when a particular event of the sort A occurs, another of the sort B succeeds, or precedes or coexists in a certain assignable way. Science is knowledge of this type carried at once to the highest attainable degree of systematic generality and comprehensiveness, and to the highest attainable degree of detailed precision. (*Mind and Matter*, 12-13.)

Now I do not think that philosophy is an expansion or continuation of this type of inquiry. To ask the reflective or philosophical question about causality, to inquire concerning its meaning and validity, is to search for theoretical understanding and intelligibility with respect to an organizing principle present in experience before it is reflected upon. If it be asked why we bother ourselves with reflective problems, rather than concentrate our energies upon specific and pragmatic inquiries, I shall here but point to an impelling, *de facto* interest which we have in accepting and employing only those organizing principles of life and of knowledge whose claim to validity has some warrant. Our concern for the validity of such basic principles is on all fours with the demand for the maximum of reasonableness in the choice of our loyalties, in our ultimate preferences and governing ideals.

Before we can make any headway with the reflective problem about causality, we need some description of the causal principle as it appears in primary experience. Any such description will be tentative and subject to revision. It will be a sort of denotative pointing to a general kind of organizing principle which is pre-reflectively had and employed. Unless it can be pointed out, noted, and described in some such preliminary fashion, there is simply nothing to reflect upon. Unless there is in this case as in all others some continuity between description and reference, there is no problem at all. True it is that every description exhibits some trace of theory, while reference purports to point to facts. Yet this tension between description and reference cannot be stretched to the breaking point, else there is nothing to describe, and reference becomes meaningless. Reference is incipient description, and description is expanded reference. I have dealt more at length elsewhere with this living continuity between discourse and reality, between perspective and fact. There is a difference between a reflective theory of causality and the actual presence of and employment of the causal principle in primary experience. It is the unreflectively used causal principle which has to expand into the reflective theory of causality. Reflection is the medium in which the ingredients of primary experience may grow into theories. A theory is true if it is the expansion and expression in this medium of things had in primary experience.

The causal principle, in its most comprehensive form, is the principle of non-indifference. No thing or event is indifferent to its surroundings. The context in which events happen has a determining influence both upon the nature of events and upon their occurrence. There is no event which is loose and separate, wholly self-contained. Draw the boundary between individual things and occurrences wherever you wish. From across any boundary line you may draw, there are invasions and intrusions. There come factors and influences which are effective in determining the nature of whatever is included within the boundaries. Things are not indifferent to the context in which they exist.



Such relevance of context is descriptive of the processes and ingredients of nature. It is dynamic and effectual. The difference made by context is not merely a difference of meaning, such as occurs in language and discourse. To say that actual things and occasions are not indifferent to one another, to specify the dynamic relevance of context, is to invoke the wider concept of organization. That is, the principle of causal determination, as it is used in primary experience, is never remote from the notion that certain events comprise systems, organized individual totalities, within which real determination of ingredients occurs. I mention this here because I do not think it correct to say that the notion of organization is an intrusion of some one philosophical theory, and that for other competing types of philosophical theory of causality the notion can be dispensed with. This is what I take Mr. Pepper to have said. Causal determination means non-indifference, and non-indifference means some kind of organization. The question of what kind of organization may indeed lead to rival theories. Remember that we have the problem on our hands only because we first have and use the principle of causality in primary experience. The problem arises only because the things and events of primary experience are organized precisely in the degree to which they are not indifferent to one another.

I have laid stress upon the fact that primary experience is in *de facto* possession of the causal principle. It is reflection which scrutinizes the title of the various possessions of primary experience, especially those principles which primary experience employs. Is its ownership of causality *de jure* as well as *de facto*? Hume, we well know, answers this question in the negative. Most of the central issues concerning the nature and validity of the principle of causal determination are touched upon in Hume's classical discussion. In this affair, every one must settle his accounts with Hume. But now, in Hume's answer to the question whether primary experience owns the causal principle *de jure* as well as *de facto*, a curious thing happens. The experience which we started with, which laid claim to the prin-

ciple of causality, is not at all the same experience whose title to causality is declared by Hume to be invalid. It is as if a defendant were brought into court in *de facto* possession of goods, and the question arises whether or not these goods are stolen property. He has, *de facto*, the goods in question. But now let the prisoner be quietly replaced by another defendant who is not even a *de facto* owner of the goods, and then let the sentence be pronounced that the original defendant's claim to the property is invalid because as a fact the present defendant is not in possession of the goods. This is precisely what Hume does. Primary experience is the defendant. It is brought to the bar of reflection on the charge of being in unlawful possession of the principle of causality. Primary experience now disappears and is replaced by impressions. This new defendant, upon being asked whether he does as a fact possess the principle of causal determination replies correctly that he does not. The verdict is then brought in that the original defendant is guilty of theft, that he has stolen the principle of causality from subjective custom, habit, and psychological expectation.

The term 'experience,' as used by Hume and by classical empiricism, does indeed denote something quite different from that which we found primary, pre-reflective experience to be and to contain. For Hume, experience means that which reflective analysis discloses to be the indubitably immediate datum or possession which has the maximum nearness and cognitive certainty. Reflective analysis enormously narrows the range and depth of pre-reflective, macroscopic experience. It eliminates from primary experience all distant and outlying ingredients, whatever is not immediately given and present. Innumerable contextual, meaningful qualities and structures which comprise the very life of primary experience, are found not to belong to reflective and analytical experience. They become problematic, inferential, more or less spurious and illegitimate accretions to the hard, solid data which reflective analysis is said to yield. In primary experience we experience, i.e., we remember the past; we experience, i.e., we perceive substantive continuant things; we ex-

perience, i.e., we recognize and converse with other selves; we experience, i.e., we rely upon the potential efficacies of forces and tendencies to issue in determinate results; we experience, i.e., we anticipate the future; we experience, i.e., we appreciate the beauty of sunset and ocean waves. The list could be extended. But turn from these examples of primary experience to reflective experience. Ask, in each instance, what it is that is indubitably had in immediate experience. The experience or memory of the past now becomes the existence in the present of a memory image. Its linkage with the remembered past is ascribed to some dimension other than literally immediate experience. The perception of things now becomes the presence of sense data, and the substantive thing drops out as something inferred or projected. Our recognition of other selves becomes an inference through analogy from directly experienced qualia. Our reliance upon the efficacies of things becomes the perceived sequences of impressions and our present expectations of similar sequences in the future. Our appreciation of values becomes the immediately felt satisfactions and pleasures present in the direct experience of the beholder or agent. No one can be oblivious of the wide gulf which separates things experienced in the primary sense from clear and simple ideas, impressions, *sensa*, essences, *et id genus omne*, of a Descartes, a Hume, a Russell, a Santayana. The concepts, the categorial relational principles of space and time, substance and causality, self and nature, good and evil—these are the perennial themes of philosophical reflection precisely because first, they are imbedded within and employed by primary experience and, secondly, they are not readily resolvable into presented data. They comprise a problematic residuum after reflective analysis has performed its task, after it has disclosed whatever is supposed to be directly present in immediate experience. Such elements alone appear to survive the test of presentational immediacy. Judged by this standard, whatever other features characterize primary experience are illegitimate possessions without valid title.

Now it can occasion no surprise that Hume was unable to locate the organizing principles of experience in immediate experience or impressions because the function of such principles is precisely to link the immediate with the more remote and outlying. They denote the schemata and patterns according to which items are related and which we follow in making inferences from observed to unobserved matter of fact. It is impossible for them to be telescoped and compressed within the directly observed and present, and it is preposterous to look for them there. To surmise that they ought to be directly observable in impressions and to be somehow baffled in not finding them there is like supposing that a bridge across a river ought not to leave the bank, or like asking one to confine his scrutiny solely to the bricks comprising a brick wall and then locate the cement.

Yet Hume does allow for one sort of bridge and he thereby mars the strict logic of his position. He admits the temporal sequence of impressions, and the knowledge of such sequences. Memory of past sequences breeds in us the expectation of similar sequences in the future. Repetition of coexistences and sequences does not in the slightest modify the loose and separate natures of particular existences themselves. Repetition of temporal conjunctions provides no evidence that impressions so conjoined have any other relation than merely temporal. The repetition of sequences merely brings about a psychological habit or custom of anticipating an event of a certain kind when another sort of event occurs and is presented. I think Mr. Stout is quite right in saying on this subject that "this merely psychological fact supplies no reason why the belief should be true. We must not confuse our habit of expecting with a habit followed by the events themselves in happening." (*Mind and Matter*, 27.) The belief that an event  $y$  will, with greater or less probability, follow an event  $x$  is a valid and reasonable belief only if the temporal succession  $x-y$  supplies evidence of some connection between  $x$  and  $y$  over and above the temporal relation of sequence. This is just what, on Hume's showing, the events do not have. Each

occurrence is loose and separate. So far as the real natures and relations of events are concerned, anything could follow anything.

Hume's analysis of causality is the outcome of a process of simplification. Primary experience employs a variety of relational structures, of categorial connections between items. Primary experience is the locus of many different types of organization with varying ranges of inclusiveness and modes of connection. This rich variety of relational ties and modes of organization is by Hume simplified and resolved into the single relation of temporal sequence. Even contiguity in space is in the end, for Hume, an affair solely of temporal relations. That is, Hume does for types of relation and of organization what the reflective analysis of science and philosophy appear ever to have done with respect to primarily experienced diversity. Reflection seems driven to accord to one quality or type a privileged status, and to resolve all other qualities into it. There results the judgment of identity. What originally appears as different from  $x$  really is  $x$ . Hume's resolution of causal determination into temporal sequence is a precise analogue of Thales' reduction of the wide diversity of natural things into water. M. Meyerson views this process of identification, this search for identity, as the very nerve of thought, reason, and science, of the *intellectus ipse*. Hume, the empiricist, is driven to his skeptical goal along the highway of rationalism. The judgment which identifies the relation of causal efficacy and determination with the relation of mere temporal sequence of otherwise unrelated and undetermined items, yields the nerve of his skeptical conclusion. And just this judgment evinces the logic of sheer identity which is the crux of traditional rationalism.

The search for identity and the rational acts of identification provide themes for a discussion which would take us too far from our present subject. But I should like to make one comment. A judgment of identity, S is P, always, I think, expresses the possibility that, *in a specific interest and context*, P may be substituted for S. Substitutability, never wholesale and at

large, but always in some restricted context, is itself a categorial feature of the things and items of experience. In this context and for this purpose, *that* can be substituted for *this*. In the domain of arithmetic, it makes no difference whether I use 5, or  $6 - 1$ , or  $3 + 2$ , or  $\sqrt{25}$ . They are 'identical.' Surely they are not. They are all different. Yet, within the context of definable arithmetical operations, any one can be substituted for any other. If a diamond and an automobile have the same economic value, i.e., price, the one can be substituted for the other in an economic transaction. This is the meaning of their identical economic value. Water is  $H_2O$ . That is, for certain significant theoretical interests,  $H_2O$  can be substituted for water. Is water really  $H_2O$ ? As well ask whether a diamond is really an automobile. One might imagine a world in which every single item was in every respect irreplaceable, in which nothing could ever be substituted for anything else. Such a world would be neither theoretically nor practically manageable. Life and knowledge, practice and theory are possible because, in specific contexts, some things can be substituted for others. When a salesman offers you a different brand of commodity from the one you asked for and tells you that it is just as good, he may be quite wrong. He probably is, but he is implicitly relying upon that trait of our world which makes both practical control and theoretical understanding possible. This categorial feature of our world throws, I think, a fresh light upon various philosophical problems, particularly that of individuals and universals. An entity is an individual in so far as it has no substitute. The nature of an individual is inexhaustible and its worth is priceless because it has no substitutable equivalents. Whether there are individuals and what they are is a different affair. The variety of modes of substitution is very great, and I do not think that the pragmatic account of instrumental substitutability exhausts the list. Substitution in the interests of theoretical understanding and mastery, in the shape of what M. Meyerson calls identification, plays its own relatively independent part.

I intend this brief excursus to show us that Hume's identification of causal determination with temporal sequence means nothing more than this. The temporal relation of uniform sequence between events may be substituted for the relation of causal determination in a specific interest. I shall presently consider what the context is which justifies such identification. But it can no more be taken to mean that causal determination really is uniform temporal sequence than an automobile can be taken to be a diamond because either could be substituted for the other in the purchase say of a rug. Positivism is just bad rationalism. I am bound to accept the judgment of scientists that they are occupied solely with observing the temporal sequences of occurrences and with formulating the laws of such occurrences, if this is what they say. But I am not thereby constrained to identify causal determination with temporal sequence. To note the high degree of abstraction involved in the physical sciences means, among other things, that the interest with respect to which temporal sequence may be fruitfully substituted for causal determination is but one interest among others, and that it does not exhaust the range of theoretical interests.

Hume reports, truly enough, that the organizing principles of primary experience cannot be located in immediately present impressions. Yet he assumes that they ought to be there found if they are to be empirically verifiable and valid. Next, following the lead of the rationalistic logic of identity, he compresses the manifold principles of organization into the one schemata of succession in time of items which have no other bond of connection save this. Now concomitant with this identification is another gross simplification in a different region. The same logic of identity is still his guide in this new province. No event in nature implies any other event. The intrinsic natures of things contain no ground for any relation whatever, not even for the temporal relations of coexistence and sequence which are observed to hold between them. But there is a region in which certain terms do determine certain relations to other terms.

This is the case in mathematics where one idea "naturally introduces" another. In "abstract reasoning concerning quantity or number," there is knowledge and demonstration because relations arise out of the natures of the separate terms. It is a part of or implied by the nature of 6 that it is twice 3. It is not a part of the nature of bread that it nourishes. This is a synthetic judgment about the conjunction of two separate matters of fact. Mathematical judgments are analytic. They are tautological because the relation between any two or more terms which can be traversed by reason collapses into the sheer relation of identity. Even if it be supposed that the logical relation of implication is not the relation of identity, that reasoning is not a tautological process, nevertheless the implicative relation of thought and discourse would still be utterly different from the relation which holds between impressions and matters of fact. One proposition may imply another; one event in nature never implies another event in the same meaning of 'implies.' If the province of reason and thought be restricted to the implicative relation, and especially if the relation of implication be itself resolved into the relation of identity, nothing is clearer than that all inference from one matter of fact to another can have no tincture of anything reasonable about it. Nature and experience fall apart into atomic, isolated bits unless they can be viewed as tied together by the relation of deductive, logical implication. It is the logic of identity which leads to the extraordinary conclusion that if deductive tautology does not supply the glue, there isn't any glue at all. Paradoxical as it may seem, Hume's philosophy represents the culmination of the rationalist tradition which sees in the structures first of deductive logic and then of mathematics, and sees in these alone, the earmarks of reason. But Hume discerned, what Spinoza did not, the vast gulf which separates all inductive probability, all inference from experience, all life and practice, from reason thus understood and defined. When Mr. Russell says that the rational man will doubt whether his food will nourish him, and whether the sun will rise tomorrow, he too is basing such skepticism upon the restriction of



reason to the assertion of strict implication and mathematical identity.

For Hume, there is no possible bridge from relations holding between things and events (resolved by Hume into merely temporal relations), to such relations and structures as may fairly be called rational (resolved by Hume and current Positivism into essential tautologies). Both of these reductions and simplifications are carried out in accordance with the apparent demands of the logic of identity. It is this double resolution which issues in Hume's uneasy avowal that the world in which he plays backgammon and converses with his friends, can lay no claim to reasonable validity or intelligibility. It is reasonable to acknowledge the presence of what is indubitably immediate, and it is reasonable to make tautologous assertions. This is where Hume ought to have stopped. We have seen that he went somewhat beyond this. He came to rely upon the memory of previous occurrences and sequences of events as providing a merely psychological and human basis for the expectation of similar sequences in the future. But this kind of overdraft upon memory can be validated neither by immediate presentations nor by rational identities. It, no less than the principle of causal determination, involves an appeal to what on Hume's premises must be quite extra-rational principles.

The question of causality comes then to this: Is the temporal conjunction of otherwise loose and separate events the only discoverable relation among the occurrences of nature? If it is, and if the only relation which can be said to be rational or intelligible is that of tautological identity, then it follows first, that the most which causality can mean is uniform succession in time (and even this is an irrational overdraft), and second, that none of the patterns of nature's processes are intelligible.

Now it is frequently supposed that there is essentially only one alternative type of theory, that according to which the cause of an event does not merely precede it with more or less uniformity, but that the cause actively produces or generates its effect. Either a functional theory or a productivity theory, either mere

temporal succession or enforced succession. And we are invited to inspect the temporal transition from cause to effect and discover something additional to the mere fact of sequence, some bond of necessary connection between the two events. The outcome of any such inspection of the transition from one state of affairs to another can be predicted in advance, especially if the notion of necessity has already been compressed into the relation of deductive, logical identity. Cause and effect are two events and they are different. Were they linked by necessary logical identity, they could not possibly be different, temporally, qualitatively, or even numerically. And let the experienced transition from one event to the other be as close and intimate as you please, let the cause be perceived to flow directly into the effect, still in the end nothing but temporal succession is experienced. Hume is on solid ground as long as the issue is defined in terms of the alternative between the mere succession or the enforced succession of two discriminable events.

Is there any other alternative? Suppose that we enlarge somewhat our area of observation. We will, in a fashion, do what Hume did when he appealed to memory. Causality is not an affair either of any single impression or even of an isolated pair of events. In vain will one search for causality in the immediately given, no matter whether it be a momentary datum or a directly perceived transition from one datum to another. Causality denotes a more comprehensive, categorial relation, exemplified if at all only in a larger range and in a wider context of events. Remember that we first found causality as an organizing principle of primary experience. Suppose that some species of causal determination over and above mere temporal sequence did characterize trains of occurrences in nature, where would one go to look for it? Plato, in search of justice, suggested that we first look for it in the organization of the community before we seek to locate it in the individual soul. No other relation than that of temporal sequence appears discoverable within the specious present. Let us see what we find when we enlarge the area of observation. The question may be thus

stated: What is the occasion and what are the circumstances which elicit and suggest the notion of control and determination, a relation other than mere temporal conjunction? There is the familiar appeal to some experience of activity, of dynamic efficacy. That this is quite inadequate for the purpose has been repeatedly shown. The source of the concept of causal determination lies elsewhere and in areas of wider spread and range. Causality means a certain type of organization of events. It names the relational structure characteristic of that kind of organization. Its source lies in the experience which we have of such organized structures.

We can, at the outset, define in thought two different possible types of relation among events. Our definitions may be regarded as quite arbitrary definitions of possible structures irrespective of any question as to whether or not they are exemplified in real occurrences and things. On the one hand, there is the relation of temporal sequence among events  $a-b-c$  etc. On the other hand there is the relation of temporal sequence,  $a-b-c$  etc. *plus* the additional relation in which the respective items  $a$   $b$   $c$ , and the order of their occurrence, are determined by some general scheme, by something, call it  $x$ , which pervades and overlaps the successive items. In the first sort of situation there is nothing but the temporal sequence  $a-b-c$ . In the second type of situation there is indeed temporal sequence which, *qua* temporal sequence, in no way differs from the first. But there subsists here a new and different relation, one which can be described only by some term connoting determination. The relation between the general scheme—to use this very abstract term—and the successive items which exemplify the general scheme is not itself a relation of temporal sequence. Nor do I mean by the general scheme merely the rule or law according to which uniform sequences occur. Laws do not prescribe or determine the occurrence of events. I mean by a general scheme something quite different. I mean anything in the shape of a governing tendency, something dominant and pervasive, whose determining presence throughout the temporal sequence makes it more than

a mere temporal conjunction of otherwise loose and undetermined events. The notion of prescription, of determination, of a causal tie which is additional to temporal sequence derives from our acquaintance with such instances of organization. It is not derived primarily from an immediate experience of activity. I have borrowed the term "general scheme" from Bosanquet. The characteristic of organization, he writes, "is control by a general scheme as opposed to influence by juxtaposition of units" (*Philosophical Theory of the State*, 151). But if all we were dealing with were juxtaposition of units, we ought not to speak of "influence." Juxtaposition is never more than temporal sequence. Determining influence, if present at all, is to be found in the constraint exerted not by some juxtaposed unit upon its neighbor, but by the general scheme and the total content demanded by that scheme.

If causal determination does mean a type of organization more complex than serial juxtaposition of units, our easiest illustrations would be found in regions where we are most familiar with instances of such organization, i.e., in the expression of intent, and in purposive behavior. Discourse is a temporal succession of sounds or marks, syllables, words, phrases, sentences. All discourse, from the babbling of nonsense syllables to a sustained and cogent argument is at least a series of events. By discourse is here meant, of course, not the contents asserted, but the psychological and physiological events which assert contents. Being a temporal series of occurrences, whether or not or in what degree characterized by regularity, is the least common denominator of all discourse. But some instances of discourse are also an exposition, narrative or argument, an orderly array of words determined by some general subject matter or thesis. Control by this general scheme pervades the entire sequence so that it is not merely a next to next affair, now this item and then that. In addition to temporal succession there is determination. In speaking or writing, what is the cause of uttering some specific word or phrase, why do I go on to the second half of a sentence after finishing the first half?

Unless there is some one thing that I want to say, the saying of which is spread out in a series of words, there would be nothing but temporal sequence. The "some one thing that I want to say" is the general scheme, the  $x$  which overlaps the successive items. It is this  $x$  which does the determining if anything does. Now I think it is this kind of situation which suggests the operative presence of determining factors over and above merely watching changes of scenery, a panorama of successive events following one another with more or less uniformity.

Similarly, in purposive behavior there is determination by a general scheme. Any plan of action, proposed end and means, denotes an organization of successive items of behavior, in addition to the temporal sequence of events. There is nothing necessarily mythical, animistic, or mythological in imputing to animal behavior something like a governing propensity, determining the sequence of muscular contractions and bodily responses throughout the entire series of events denoted by the phrase "rat learning to find his way to food through a maze." The expressions appropriately used by Mr. Tolman (Purposive Behavior, *passim*) "objectively defined capacities," "immanent determinants," definitely stand for something additional to any string of events, whether uniform or not. There is here a determining factor spread along the entire series, not compressible into any specific occasion or sequence of occasions. There is a determining general scheme. Were there no such general determinant discoverable in the situation, there would be no basis for distinguishing this kind of series from a simple temporal succession. It may be added that the discovery of such immanent determinants is not dependent upon introspection. Indeed, introspection limited as it is to the specious present or to the just vanishing phase of the just preceding specious present, is singularly inept to make any such discovery.

Is there anything analogous to determinations by a general scheme in physical processes as well as in discourse and in organic behavior? The physical order appears to be a concatenation of things and events, juxtaposed, where all relations

are of the next to next sort, where immediate impact is the sole relevant antecedent of change, where action at a distance is inconceivable. A row of ninepins where change is propagated through direct impact of neighbor upon neighbor supplies the basic cue for traditional types of materialistic naturalism. There appears here little or no trace of the operative presence of any determining general scheme in addition to next to next temporal succession. Indeed, if the physical order be defined in terms of the categories of space and time, each an independent absolute, then we should not expect to find in the physical order any relations other than those of spatial continuity and temporal succession. Both relations are, *prima facie*, of the next to next sort rather than relations subsisting between a general scheme and particular items. In such next to next impact there is no action at a distance across space. And in such next to next immediate succession in time, there is no persistence of continuant structures. Each present state is replaced by its immediate successor. The physical order thus conceived exhibits the maximum of immediacy and the minimum of organization. With the physical order defined in such terms, physical causality can only mean temporal succession with as much or as little uniformity as may be observed. It is not surprising that in general physicists have favored a functional theory of causality. But the immediacy of impact and of next to next temporal succession is, I suspect, a good deal of an abstraction, and I also suspect that there are some grounds for ascribing to the physical order itself something in the way of general schemes, spanning spatial and temporal distances, thus supplementing the mere sequence of events. Of course, only the physicist has the right to say whether he finds any use for this type of relational structure among events, a structure which shows determination by some general scheme as well as temporal succession.

But I am not here particularly concerned with empirical illustrations, nor do I care how scarce or common they are supposed to be, nor whether they are found only in the world of life and mind and not in the physical order as such. I want to stress

the difference between two types of relation among events. One type is that of mere succession. We might call it the Humean type. We may call the other type that of succession with dominant determination. Both types display a temporal succession of events. If now, your interest in observing events is such that it can be satisfied by attending solely to the temporal order of the events, you will not discern any difference between these two types. And the important thing to note is that both the interest in prediction and the interest in control are concerned primarily with knowing what comes after what. Any temporal sequence exhibiting some measure of uniformity provides the basis for a corresponding measure both of prediction and of control. That is, the specific and the pragmatic questions, what follows what, and what is to be done if you want some definite event to occur, call for no more than a description of sequences and of their mutual, functional correlations. If you want to catch causal determination as well as temporal sequence, you will have to employ a different kind of net. A sequence of events is causal in addition to being temporal only if the successive events supply evidence of a persistent, dominant determinant or general scheme. The discovery of causal determination is dependent upon the discovery of organization. Our human concern with organized structures and processes is different from any sheer interest we take in watching things go by, as when we sit in a train and observe the panorama of changing scenes. Our concern with organized structures is also different from our interest in predicting specific future events and in controlling the sequence of occurrences. This alternative, that of idly staring at things or effectively controlling them, appears to be the one with which Mr. Dewey presents us in asking us to choose between a spectator account of knowledge or an operational and instrumental interpretation of the cognitive interest. Our interest in *understanding* things seems to me to coincide with neither of these two alternatives. The interest in organized structures is the formal earmark of reason, both theoretical and practical. Reason evinces a concern for form, for determination of specific

items and sequences by a general scheme. Temporal successions become intelligible, they are understood in proportion as the successive events are discovered to be determined by dominant forms. Such intelligibility contributes nothing, at least directly, to either prediction or control. All that these require is reference to temporal succession. Meaning and intelligibility, as well as causal determination, spring from the presence of dominant general schemes.

The categories of substance and of causal determination are yielded through no specific nor pragmatic inquiry. They are discovered through reflective inquiries. Nor are they simply given in momentary experience. Whence, for reflection, are they fetched? Where else but from primary experience where they are pre-reflectively employed, where their operative and functional presence gives meaning, depth and solidity to the world in which men live and act. The relation between primary experience and reflection is analogous to the relation between process and form which I have sketched in an earlier paper. The categories which thought requires to render the world intelligible are not arbitrarily projected into things. Nor are they just found in spots, localized in specific regions of middle-sized fact. They are not merely an affair of deductive logic, of sheer identities and tautologies, belonging to an independent world of discursive reason. Least of all are they just irrational, instinctive proclivities springing from an animal faith which is the polar opposite of all that is intelligible and reasonable.

The validity of the category of causality in understanding and in interpreting nature's processes depends then upon one condition. This category is valid only in so far as the processes of nature possess an organized structure which is expressed and spread out in the temporal sequences of events, making of them something more than mere sequences. The interesting thing is that the same principle which renders intelligible a sequence of events, i.e., organization by a dominant, general scheme, is also the source of causal determination. It should be added that this category, like all others, is wholly abstract and formal. It tells



us nothing of the kind or range of organization which we may expect to find. The inexhaustible fertility of nature's processes generate a diversity of organized structures, with varying ranges and areas of causal determination. It is these which occupy the region between the two extremes of mere temporal succession and of pure tautology. There is no causality at these extremes. But these are just ideal limits, the products of abstract substitutions. But whether or not these two opposite extremes are ideal limits, at least we have located causality. It is present wherever processes are organized. All processes which are comprised between these two ideal limits exhibit some kind and degree of organization and hence of causal determination.