

in an absolutely continuous series in which every part is related to every other in terms of a quantitative equivalence. If you take away these two conceptions of continuity and quantitative equivalence you have nothing left of the notion of determinism from the empirical standpoint. Necessity demands that between phenomena shall exist not mere uniformity of sequence, but also a necessary bond. This necessary bond, as far as science knows it, is expressed in terms of equivalence. *The effect must equal the cause.* There may of course be a metaphysical notion of necessity as there is of freedom, but with this psychology as a science has nothing to do. The laws that govern its phenomena, as far as it knows them, are those of the mental life, in which efficient causality is replaced by final causality, in which relations of quantitative equivalence are replaced by those of worth. We are no longer in the world of mechanical necessity, but in the realm of values. The most significant fact of consciousness is that it chooses, and its clearest act of choice is found in its voluntary states.

Empirical psychology then must affirm the freedom of the will. It may leave to metaphysics the ultimate question of freedom and determinism, but for itself as psychology it knows no mechanical necessity. Man may be metaphysically determined; he is empirically free.

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### THE LAW OF CONGRUOUSNESS AND ITS LOGICAL APPLICATION TO DYNAMIC REALISM

IN recent articles by Professors Tawney, and Bawden, we have had illuminating discussions of utilitarian epistemology and pragmatic methodology.<sup>1</sup> It is possible that some of those commonly classed as pragmatists would repudiate the term, nevertheless tendencies other than that specifically indicated by this much-abused term are so closely bound up with it that the sympathetic energetic and objectivizing movement forms a very genuine bond. If the present paper seems to magnify differences, it is certainly not because the writer fails to appreciate the points held in common by 'pragmatic,' 'genetic' and 'dynamic' thinkers.

Utilitarian epistemology seems to be content with the conception that 'the laws of matter and of life are the laws of our needs.' To this all may agree whether utilitarians or not. But it is a violent

<sup>1</sup>THE JOURNAL OF PHILOSOPHY, PSYCHOLOGY AND SCIENTIFIC METHODS, Vol. I., Nos. 13 and 16.

wrench, alike to logic and common sense, to take the further step, and declare that the laws of matter and of life are what they are *because of our needs*. The appeal to biology is unwarrantable here. What biology and physics suggest is rather that you and I and the universe have grown up together in reciprocal relation. It is, in a sense, true that the universe (as I perceive it) corresponds to my needs, but this is an egocentric and psychological view. As a philosopher I recognize that I am what I am in response to the needs of the universe, and the universe is bigger than I. It is true that the stone attracts the earth and molds its figure and determines its weight to an extent proportional to the respective masses of the two bodies, but this is wholly overshadowed by the influence of the earth on the stone.

Now what we mean by dynamic realism stands for the view that all parts of the universe are reciprocally bound together because they act together and have grown to be what they are in organic unity of development. Pragmatism is then justifiable in so far as it refers to a methodological concept. That things do work together and our needs are satisfied when a certain set of postulates are conformed to, is, in so far forth, evidence of the correctness of the postulates, but this is only evidence that by this means we have discovered a part of the organic harmony covered by the law of congruousness. The theory is not true *because* it satisfies our needs, but the fact that it satisfies our needs *is evidence* that the theory fits into the organism.<sup>2</sup>

Realism is not satisfied with one aspect only of being, but accepts the fact of reaction as evidence of the *other* by the reaction of which with self realization becomes possible. In what follows a few logical preliminaries are set in organic relation without expecting to add anything to the content of our thought. To the objection that reference to recent logical discussions is wanting we have always, for want of a better, the reply of the Musselman who destroys all books but the Koran.

First, then, as to the law of cause and effect. The naïve mind recognizes that certain causes produce certain effects, and that is all there is about it. If interrogated as to how he knows that one event causes another, he will appeal to uniformity in sequence. The cause invariably preceded the effect. But a little reflection reveals the fallacy of *post hoc, ergo propter hoc*. In a shooting-gallery, a deer, a camel, a dog and several ducks follow each other across the field of view in unvarying succession. The dog is not the cause

<sup>2</sup> With regard to current pragmatism, Professor Tawney well says: "Facts, meanings, and needs are abstractions from concrete experience . . . they develop together by a law of their own activity," *l. c.*, p. 344.

of the deer. The running of the dog is not the cause of the running of the deer. They are related by a common bond to an endless chain which moves and imparts its motion to them both alike. But the movement of the chain is due to that of a sprocket wheel set in motion by the explosion of gasoline in a suitable engine. The boy who first sees the bowing trees and then feels the wind, fancies that the trees produce the wind.

An attempt at a scientific theory of causation catches at the analogy of the endless chain. All the activities in this world have their coherence in one common organic unity. One part is necessarily related to every other, and one or other of two events may be looked upon as cause or effect at will. Although, to man, experience becomes a succession of events, we know that this is not so, but that there is a continuous whole of activity. We, it is true, catch only the occasional flash of the lightning, but we know that the electric discharge which it intermittently reveals to us is a continuous process. So of all reality; it is a part of a continuous whole, one part is not possible without all. The geometry of loci admits of no hiatus in the trajectory of its forces.

Our minds fill out the observed intervals in experience, not by interpolating in them the intervening modes, which, not having been in experience, can not be known, but by postulating a *nexus* which we term cause. The term is practically useful but it is philosophically faulty if not false.

If by one event causing another we mean that the existence of the one event prior to and contiguous to the second is sufficient reason for the second event, which then follows as a matter of course therefrom, the concept is undoubtedly false. Out of the continuous stream of organically connected reality we catch glimpses of two elements, but one is no more cause of the other than the dog was the cause of the deer in the gallery.

What actually occurs is more as though, in watching an intermittently luminous electric discharge, we establish point after point in the course until we have interpolated elements enough to protract the curve of the constant-flowing discharge, itself not visible to us. We have plotted a curve of nature's uniformity and established the form of a part of the path of reality. Such is the work of science. Gradually a considerable part of some subordinate chain of events becomes filled in by our plotting, and a formula or 'law' for the observed uniformity is discovered. Within these limits, we say, the laws of cause and effect have been laid down. There is no objection to such use if we know exactly what is meant.

Even in logic, the convertibility of these terms is indicated by the expression, 'final cause,' where we mean the *effect designed to*

*be produced.* This usage is as true (and as false) as the other. The last portion of the trajectory exists as much for the first as the first does for the last.<sup>3</sup>

The practical mind becomes very impatient of such generalizations. A miner drills four six-foot holes in a shaft, and charges each of them with two sticks of giant powder, and places in each a fuse properly tamped, ending in a primer of detonating material. He connects the several fuses with wires, and the opposite ends of these wires are placed in the circuit of a powerful battery. After all precautions are taken, the circuit is closed, a current of electricity passes through the wires and in the primer meets resistance sufficient to produce heat, causing the primer to detonate with such violence as to explode the powder, and thus to break down several hundred pounds of quartz. What caused the breaking of the ore? None of the elements enumerated could have been omitted. All were part of a plan existing in the mind of the miner, but all were related to each other in chains of observed sequence. Any failure properly to comprehend these attributes (activities) of the materials used would have prevented the success of the operation.

We discover certain relations and avail ourselves of them, and then describe the uniformity we discover as a causal relation. It must also be observed that all so-called causal relation is reciprocal. One activity,  $x$ , may come into relation with various others,  $a$ ,  $b$  and  $c$ , and the resultant is neither  $x$  nor  $a$ ,  $b$  or  $c$ , nor yet a constant modification of  $x$  that could be represented by  $ax$ ,  $bx$  or  $cx$ ; it is rather a series of new activities,  $p$ ,  $q$  and  $r$ . In other words, cause implies two activities and the result is something different from either.

This is not the usual form of describing cause, but a little reflection will prove it correct. All cause implies change and the elements of causation are dynamic. But change involves comparison, and less than two elements can not be compared.

All causal relation we said is reciprocal. It matters not whether the clapper strikes the bell, or the bell moves and strikes the clapper, or rather, in either case, both clapper and bell strike each other. The result, we say, is sound, but the result is also various other things quite as truly. A myriad molecular changes wrought into the inextricable fabric of reality stand in relation to the impact of bell and clapper.

One great difficulty in getting any clear idea of cause and effect is that there is no such thing as an example of simple cause and effect, and this betrays the falsity of the usual conception. A ball thrown against a wall rebounds at an angle of deflection determined

<sup>3</sup> Cf. Underhill, *Mind*, April, 1904.

by the angle of incidence. The wall diverted the ball, caused its change of course. What the wall did was to add a large number more to the already innumerable factors in the formula for the trajectory of the ball. One of the 'results' is expressed in conformity to a uniformity observed in nature which we call a law. Others we fail to observe or to estimate. What was the cause in this illustration, let us say of the change in the course of the ball? Was it the impenetrability of the wall, the elasticity of the ball, the particular angle in which the wall stood to the path of incidence of the ball, or the inertia or velocity of the latter?

It was long supposed that influence passes, in causation, from one thing to another, but this idea of an *influx physicus* has been given up as adding nothing new but difficulties. To say that one thing becomes an occasion for another is equally unintelligible.

Many first-rank philosophers (*e. g.*, Lotze) have abandoned the attempt to define causation, while admitting that it is a necessary postulate. It may be permitted to us to go further and suggest that causation as such can not be defined because it does not exist in the form of a plurality of causes. What does exist is such an indissoluble linking together of all realities in fixed relations as makes of the whole a complete organism, every part being implicate in every other. The complete organism is the 'ground' of all being, and is the only thinkable cause.

Our daily praxis discovers small segments of this continuity and reveals fixed relations therein, and, forthwith, describes a certain group as a necessary prior, or cause, of a certain other group of events. Our attempted interpretation of causation, while it relieves us from the responsibility of explaining every uniformity in phenomena by some special cause, or of evoking some inexplicable power or modulus or property of being as a general cause, does suggest two alternatives in our conception of the 'ground' of reality. These alternatives are somewhat as follows:

First. The world is something created in all of its varied complexity and set in motion by an infinite creative force, and what followed the creative act is the self-explanatory out-working of the mechanism. If we know what God knows and as completely as he knows, we could predict every occurrence as we now predict eclipses.

Second. The world is not a machine but is itself instinct with power, and all its parts fit because they grew together and belong together. If our knowledge were complete enough we could predict all that has been or is to be from the part which each element has in an organized whole.

The first of these statements is the doctrine of transcendence and the second that of immanence, or a better distinction is that which we

have used between mechanism and organism. In arriving at a satisfactory settlement, or in making a selection between the two, it is necessary to notice that what was called self-explanatory in the case of mechanism is by no means so. No matter how complete the mechanism and no matter how great the power imparted to it, it is not self-evident that the course it would pursue must be one rather than another. The mechanism must be perfectly adjusted, its materials must have certain properties, its forms must conform to certain adaptive imperatives, and all these characteristics belonged to the mechanism from all time and so could not be created, or else creative power has been added to it from some source. This can only be from the creator himself, for the world is supposed by definition to include all else. Thus the creator has added of himself to the world in creating it. Again, if power be applied in launching forth the universe, it must come from the world or from the creator. If derived from the creator (all other sources being excluded) this idea also means that the creator puts himself into his universe. But this destroys the idea of mechanism and gives us organism.

But, to defend at least the associated idea of transcendence, we may say, 'Yes; but not all of the creator is in our universe.' The reply is, that, by definition, the universe is all. A creator not creating is no longer a creator, and if he be creating, that created becomes, *ipse facto*, our universe, for a universe does not exist divided against itself. But certainly, it is objected, we can not understand that all of God is immanent in his creation. No; only that all of God as creator is in his creation, and that to speak of a world created by his will and preserved by his power is to admit that creation is perpetual and continuous. That there may be other activities besides creation may be admitted, but the prayer, for example, 'Create in me a clean heart, O Lord' may suggest that there are numerous spheres of creative activity aside from those in which our cosmology is wont to find its orbit.

The world then may be described as an organism in which human beings live and move and, in common with all other existences, find their being. It is no accident that part fits with part any more than it is that the innumerable cells of the body cooperate in an organic unity and each bears the impress of the whole.

If one wishes to call the tie that so binds the universe together 'cause,' there is little objection. We may call gravitation the cause which insures the movement of the planets in their orbits, but we may be sure that when we fully understand the mysterious law of gravitation it will not be possible to dismember it from the organic whole of universal causation.

Thus far we have availed ourselves of metaphysical license in

treating of universal and absolute qualities as though we understood them. We must remember, however, that they are creations of our mind; necessary creations, it may be, but not elements of knowledge.

If we were called upon, and were able, at this point, to make a satisfactory definition of knowledge, our quest would end and the remainder of this inquiry would become unnecessary. For the present we may say that knowing is the appreciation of changes in experience in definite relation to each other and to the perceiving self. Knowledge refers both to the act (cognition) and content of knowing.<sup>4</sup>

Knowing lies at the base of all voluntary action. In all the Germanic languages the roots of the verbs 'to know' and 'to do' are similar or identical, *i. e.*, knowledge is power. Recently psychology has emphasized, perhaps extravagantly, the correlated fact that there must be an act of will in all knowing. In fact all expressions of subjectivity must be voluntary, otherwise they are not subjective.

We have defined reality as the union of subjective and objective, but this implies a curious fact, *viz.*, that we do not know things as they are. Our realities are of our own making. Thinking is, as has been said, 'thing-ing it.' Things are not known as such but are inferences. Experience is the known, all else is inferred. The correctness of our knowledge will depend, first, on the uniformity of relation between experience and the objective reality; secondly, on the completeness of experience; and thirdly, on the certainty of our methods of inference.

Experience is the product of a reaction from without upon our sensorium, the latter reflecting in consciousness. If the experience arise from a light-wave, for example, we must, first, assume that when a wave of certain form, periodicity and velocity reacts upon the mind, it represents uniformly a definite objective validity, or is such validity. It is presumed to have definite correspondences and differences (relations) when compared with other objective phenomena. Secondly, we receive the impression through the medium

<sup>4</sup>Very often knowledge is defined as though it were simply that known, but this is only a portion of the extension of the term. Knowledge is, philosophically, the process of knowing and the content of the process. It has been defined as 'a representation of facts in sentient symbols' (Carus), 'a description of facts' (Kirchhoff). The latter use applies to stored knowledge in books or traditional information and the like, a sort of mental conserves. 'All knowledge on its subjective side is belief. To know a truth is to be assured of it. What the term knowledge implies more than belief is an objective fact, namely the adjustment and conformity of belief to reality or truth' (Sully). 'Activity is a fundamental property in conscious life' (Hoeftding).

of delicate sensory apparatus (eyes, etc.), and each particular wave length is conveyed along certain nerve channels to points in the brain identical with the receptive points in the retina, so that this particular wave length (color) is discriminated each time it occurs. The accuracy of perception depends upon the perfection of this mechanism. But the mechanism is both imperfect and incomplete. We have no organ for perceiving ultra-violet or X-rays. We even perceive differences between colors very imperfectly—we are all more or less color blind—and, at best, very few out of the indefinite series of wave lengths and periods and forms are at all perceptible. This limitation is necessary in order that we should analyze at all. The correspondence between the internal and external is very incomplete and only partially accurate. Thirdly, our methods of inference are such as are based on correspondences in *time*, *space* and *mode*. Time Kant defines as the necessary 'form' of our inner apprehension, as space is that of outer experience, *i. e.*, our own apprehension of our own acts must be in a relation of sequence, and our apprehension of experiences through the senses necessarily is referred in terms of extension. Mode refers to differences in kind resulting from analysis within our sensorium. Consciousness is differently affected by vibrations of different length and period, not because of any special reason why vibrations of one periodicity should produce one sensation rather than another, but because correspondences and interferences between the nodes of the stimulus curve and the complex curve of our vital organism vary with variations in the form of either trajectory.

Thus it is evident that all of the three necessary 'forms' of knowledge of external realities are of subjective nature and dependent upon the structure of the organ and, it may be, upon necessities of thought. Moreover, nothing is more certain than that none of these represents an external reality as such. Time, as time, has no existence apart from experience. To an infinite being time and space would be other than they are to us, if they could be supposed to exist at all. Mathematicians threaten us with the destruction of spatial relations, as we know them, by the introduction of a fourth dimension. Mode is valid for us, and it is necessary for the individual to determine its correspondence with the experience of other individuals before it can be assumed to be valid for them. This correspondence is the basis of all communication but it is only approximate. What I see and hear is not identical with what you see and hear under identical external conditions. If you are color blind and I have no ear for music, the difference is still more apparent, but is not more real.

The first limitation on knowledge, then, is its relativity, the



second its incompleteness, the third its errancy or uncertainty. We find ourselves, as thinkers, in a bad way. In the first place, we have no direct assurance that the knowledge we seem to have is a correct picture of reality; in fact, we know that it is not. We believe it to have only such constant correspondences to it as may serve our practical purposes. Secondly, the picture we do have is like a coarse newspaper half-tone, only a few points here and there are left to represent the infinite variety of light and shade in the original. Thirdly, using the same illustration, much of the objective reality was out of focus in our organism, and the print (reproduction) is so roughly made that many of the original distinctions are obliterated. We are to be congratulated that there remain enough elements of correspondence so that I can recognize it, and that my description of it can frequently be recognized by my neighbor when compared with his own mental image of the same phenomena.

Subjective idealism (Fichte) recognizing these limitations of knowledge, states that the perception of the world is simply the product of our creative faculty and that, outside of the cognitive spirit, this world of things has no existence, so that there is no such thing as an act of cognition, but only an act of representation.

But, without denying the subjectivity of cognition, we are helped by our discussion of organism to the conclusion that, since we and our cognitive apparatus are organic parts of the cosmos and have grown out of it, or rather, have grown in it, that which our cognition invariably does must have an invariable relation to what invariably is. It would be strange if this particular branch of the cosmic organism should bear fruit that would spring up into no likeness with the parent stem, however limited, however imperfect these correspondences may be. We are forced to believe that, so far as they do go, and with whatever accuracy they do act, our cognitive activities express fundamental correspondences with external validity. They are facts of experience and not phantasies.

Only on such assumption as this is science possible, and without it we might fail to find the inducement to carry out the obligations of daily life. To such conclusion as this Kant came in his practical reason after passing half a lifetime in the cheerless realm of pure reason, but it is not necessary to divorce pure reason from half (and the better half) of its necessities in attempting to follow out the other half to the logical conclusion. One would not wish to dwell forever on the cold side of the moon.

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