

Vol. VI
No. 3

Monograph Supplements

October, 1904
Whole No. 26

THE
Psychological Review

J. MARK BALDWIN
JOHNS HOPKINS UNIVERSITY

EDITED BY

HOWARD C. WARREN
PRINCETON UNIVERSITY

AND

CHARLES H. JUDD
YALE UNIVERSITY
(*Editor of the Monograph Series*)

Time and Reality

BY

JOHN E. BOODIN, PH.D.
Professor of Philosophy, University of Kansas

THE MACMILLAN COMPANY,
41 NORTH QUEEN ST., LANCASTER, PA.
66 FIFTH AVENUE, NEW YORK.
AGENT: G. E. STECHERT, LONDON (2 Star Yard, Carey St. W.C.);
LEIPZIG (Hospital St., 10); PARIS (76 rue de Rennes).

PREFACE.

While the question of priority is not likely to be raised in regard to the central conception of this essay, it may be well to say a word about its genesis and historic setting. While I had previously had empirical leanings, it was the Harvard period, from 1897-1900, which brought to full consciousness my standpoint with reference to the fundamental concepts touched upon in this paper, especially that of time. This was not so much on account of the thinking going on in this direction, as because of the stimulating thought atmosphere and the generous recognition of any productive effort, however different and however critical of their own thought, on the part of such philosophers as James, Royce, Münsterberg, Palmer and the late Dean Everett. We developed our own meaning by wrestling with those thinkers, not by imitating them. The mere imitator was always held in contempt.

My own time concept came to clear consciousness first during the year of 1897. Through a closer study of Hegel, and especially through the reading of Royce's profound statement of idealism in his supplementary essay in his 'Conception of God,' I was strongly impressed with the inadequacy of the position of absolute idealism to meet the demands of experience. My reflections that year culminated in a paper read before Royce's Hegel Seminary in the spring of 1898. In this paper I stated the substance of the position here advanced. This paper was worked over next year and presented as my doctor's thesis in the spring of 1899. While I hope that my present statement is clearer and completer, I have seen no reason to change my main position. My conception of time was known at Harvard as 'the creeping in' concept, as I emphasized, instead of the serial character of time, the fact that it creeps into all our calculations and makes all our systems of truth unstable.

While the above will indicate somewhat what I owe to Professor Royce's generous criticism and coöperation, I feel that

perhaps I owe even more to the sympathy and friendship of Professor James, as well as his brilliant suggestiveness. While I knew little about his metaphysical theory in formulating the outline of my own position and never had any metaphysical course under him, yet I lived in the same world with him, and have enjoyed ever since the inspiration of his encouragement and his faith in my poor efforts. Without this faith I should not have been able to do what little I have done. If this little work were worthy of being dedicated to so great a thinker, I should dedicate it to him.

What I owe to the appreciation and suggestions of the other teachers in the distinguished group I mentioned above is too subtle to state, and I only appreciate it more as time goes on. Perhaps the greatest help of all was their generous faith that I had something to say. I hope the future may bear them out in this, if the present does not. To the fine philosophic enthusiasm and fairness of Professor James Seth, especially in his Hegel Seminary at Brown, in the year 1895-1896, I also feel that I owe a great deal. To the great immortals of all ages, who have handed down to us the torch of truth, I hope the following pages will vaguely hint my indebtedness.

For the encouragement of the reader, who may get tired of the somewhat technical discussion of the first two chapters, I want to say that, should he have the patience to go on, he will find the later chapters more concrete. It seemed best, however, to develop first the logical definition of the central concept, as the metaphysical position largely hinges on this. I have tried, however, in order not to tax the memory of the reader too much, to make each chapter, dealing as it does with a special phase of the problem, a unit. While the style is not all that could be desired, I think that the reader who has the courage to read the paper through, will get a rather clear and definite idea of my main position, and that in the end perhaps should be the test. Hoping that this paper may help along the present discussion and may be prophetic of something better on my part and still more on the part of others, I venture to throw out these fragmentary hints.

I had hoped to see this essay in print during my connection

with Iowa College, Grinnell, where I held the chair of philosophy, 1900-1904. But as that aim, owing to the vicissitudes of publishing, was not realized at that time, I want to express at least my appreciation of the scholarly and helpful spirit of that noble institution, which did not allow me to lose sight of my purpose. I also want to thank my present colleague, Dean Templin, for reading the proof as well as valuable advice.

THE UNIVERSITY OF KANSAS,
Lawrence, 1904.

CONTENTS.

CHAPTER I.

THE NATURE OF TIME.....	5
-------------------------	---

CHAPTER II.

TIME DEFINED IN RELATION TO SOME OTHER CONCEPTS:	29
(<i>a</i>) Time and Space.....	29
(<i>b</i>) Time and Irreversibility	31
(<i>c</i>) Time and Number.....	32
(<i>d</i>) Time and the Infinite	38
(<i>e</i>) Time and the Continuum.....	42
(<i>f</i>) Time and Causality.....	48
(<i>g</i>) Time, Chance and Necessity	53

CHAPTER III.

TIME AND BEING — A SURVEY OF ATTITUDES.....	60
---------------------------------------------	----

CHAPTER IV.

TRUTH AND PROCESS.....	81
------------------------	----

CHAPTER V.

THE PROBLEMATIC.....	95
----------------------	----

CHAPTER VI.

TIME AND NON-BEING.....	109
-------------------------	-----

CHAPTER I.

THE NATURE OF TIME.

Let us go at once to the heart of our subject. What sort of a concept is time? To follow a somewhat antiquated terminology: Is time a formal or material concept? Or to be more modern, perhaps, is time a purely ideal construction or must it be considered also as a character of reality?

It has been the fashion in modern philosophy to go back to Kant in the discussion of almost every epistemological problem. This has of course its historical justification. For the understanding of the problems of philosophy, however, Kant is often valuable for enabling us to see things out of focus. So much did he throw things out of focus that it will take philosophy a long time yet to see some problems in their proper bearings. In fact, that in Kant which has been historically most influential is often that which is most arbitrary.

A. Time as a Form of Perception. (Anschauungsform.)

This is the case with Kant's fantastic definition of time and space as forms of perception (reine Forme der sinnlichen Anschauung) or, to use the even more imaginative mode of expression of Schopenhauer, 'the veil we throw over things.' Such crudities are interesting from the standpoint of logic chiefly because they lead us back to the beginnings of conceptual definition. Kant's utter disregard of genesis reminds one of Schopenhauer's irony as regards Jacobi that he took everything for *a priori* which he had learned before he was twelve years old, only that the period would have to be extended and the class enlarged so as to include Schopenhauer himself.

Wundt has pointed out in an interesting way that to each one of Kant's three main theses, in his metaphysical deduction, an antithesis can be stated.

“Kant sagt :

(1) Das Zugleichsein oder Aufeinanderfolgen würde nicht in die Wahrnehmung kommen, wenn die Vorstellung der Zeit nicht *a priori* zu Grunde läge.

(2) Man kann, in Ansehung der Erscheinungen, die Zeit nicht aufheben, während man ganz wohl die Erscheinungen aus der Zeit wegnehmen kann.

(3) Die Axiome, dass die Zeit nur *eine* Dimension hat und verschiedene Zeiten nur nach einander sind, können nicht aus der Erfahrung gezogen sein, weil sie apodiktische Gewissheit besitzen.”

“Darauf lässt sich antworten :

(1) Die Vorstellung der Zeit würde niemals entstehen können, wenn nicht ein ihr entsprechende Ordnung in der Wahrnehmung gegeben wäre.

(2) Man kann die Zeit nicht ohne Erscheinungen denken, während man ganz wohl bei einer Erscheinung von der Zeit abstrahiren kann (insofern man z. B. bloss ihre qualitative und räumliche Beschaffenheit in Rücksicht zieht.)

(3) Die Axiome der Zeit können *nur* aus der innern Erfahrung gezogen sein, weil sie abgesehen von der Aufeinanderfolge unserer Vorstellungen völlig gegenstandslos sind, indem in einer leeren Zeit weder ein Verlauf noch eine Aufeinanderfolge stattfindet.”¹

The difficulty with Kant is that he fails to distinguish between the formal aspect of time and the content of time. Time, however, is *a priori* only in the sense that any concept is *a priori*. It is a form or presupposition of perception in the sense any concept is, though being involved in all concrete experience, bound up as it is with the perceiving subject as well as the perceived object, it has a peculiarly fundamental place among our concepts. Kant rightly pointed out—and this is his everlasting service to philosophy—that the mass of sensations cannot as such present us with universals. For us subjective construction must come prior to the objective universal. As our acts can only become fruitful or successful, however, in so far as they are based upon proper anticipation of the character of the object, the concept cannot remain a mere *a priori* or subjective construction, but must be tested with reference to further behavior; the only purely *a priori* concept is the totally false one, the one that is mere subjective construction and meets with no response on the part of reality as perception and action.

Is there no truth at all, then, in the grotesque Kantian position? Yes, there surely is; and even its naïveté may make it

¹ Wundt, Logik, Vol. I, 2d Ed., p. 482.

all the more suggestive. Kant was right in holding that in order to perceive succession we must be capable of retaining in some way the past in the present. The moments of the succession must in some way be apprehended at once by the subject. But it is obvious also that in the sense in which the moments are apprehended at once or as coexisting, they are no longer successive; and hence the Kantian time-form so far from explaining the possibility of perceiving succession makes any such perception impossible. In his space metaphor of one dimension, on which his fourth and fifth theses are really based, Kant has lost sight entirely of the character of succession and emphasizes merely the simultaneity or timelessness of the time-form. So little did Kant differentiate time from space that it is obviously coexistence rather than succession that he has in mind in his statement of the axioms. Since the arising of the spatial series and the continuum of space, as we shall see later, must be explained with reference to time, it is obviously begging the question to make time simply a dimension of space.

The real antinomy which confronts Kant and Wundt alike is: *How can a timeless form take account of a real succession?* Wundt's antitheses maintain that there must be some correspondence between the time form and the perceived succession. But just what correspondence can there be between the simultaneity of coexistent order and the *nach einander* of empirical succession, where the existence of one fact excludes the existence of another? In the order 1, 2, 3, 4, etc., the members are equally present, but in counting or beating off 1, 2, 3, 4, etc., when one member is perceptually present, the others are not present in the same manner. But if coexistence and succession are antithetical kinds of fact, how can a timeless or *a priori* order correspond to a real succession? While Wundt is right in pointing out that time must depend upon experience for its character, he has entirely failed to show what this character must be. In attempting to find a correspondence between the *a priori* form and empirical succession he has only shown the utter untenability and absurdity of the Kantian position.

What deters the Kantians from any attempt at a logical analysis of time and makes them put it into a class by itself, or

at most with space, is its fundamental character. It is involved somehow in all our experience. It is presupposed in all our conceptualizing. The whole world of significance presupposes it, hence how can we presume to understand it, *i. e.*, conceptualize it? Still, is not this very fundamentalness of time part of its significance? Because it is so intimately interwoven with our conceptual fabric, it is indeed difficult to extricate it and show its fundamental character; but it becomes all the more necessary to do so in order to have a valid theory of experience. It is indeed a crucial concept, as Kant saw, of any theory of reality.

Apart then from the mysticism of philosophy in the past, we must treat time as a concept, try to find what sort of a concept it is and try to seize upon its ultimate character, its ultimate significance, even though this should be involved in all significance. If the time character must be such as to enable us to explain succession, we must at any rate be careful not to define it in such a manner as to make succession absurd. The time and space veil we are supposed to throw over reality is at any rate a conceptual veil, an ideal system, the basis for the genesis of which must be found in the real, and the truth of which must be tested with reference to the behavior of the real. As all concepts have a formal aspect, involve ideal construction, our inquiry is, what sort of content or meaning time must have for us in order to make experience consistent.

B. Time as a Formal Concept or Ideal Construction.

Let us take up first the attempt to define time as our ideal construction and see what this leads to. This is already implied by Kant in his *Anschauungsform*. Wundt asserts that time is not so much a representation as an order of all our representations. It is this order character which has been emphasized by modern logic. Time has been regarded as primarily a series. Sometimes the qualitative, sometimes the quantitative character of this series has been emphasized, according as the idea of order or the idea of measurement has been uppermost. We shall take up first the definition of time as a qualitative series.

1. Time as a Qualitative Series or Order Concept. — Two

things are evidently involved in defining a qualitative series : position and direction or the constituting of order. Let us first deal with the aspect of position. Fortunately we have a rather clear statement on this point by modern thinkers. It is held by Münsterberg, Mach, and Teichmüller,¹ for example, that there are time qualities, just as there are qualities of sound, light, and touch, and these time-qualities serve to indicate position in a time-series, just as space-qualities indicate position in a space-series. Not only do the particular contents according to Münsterberg, have unique time-qualities, but the different time-series or time-wholes and their parts also have special time-qualities.

The time-series, then, furnishes us with a perspective, where different time-values are indicated by different qualitative positions. Each individual has of course his own perspective, which constitutes his own individual history, but by means of social communication we agree upon a common perspective, which shall be the same for all of us ; and this is what we mean by objective time. Time is universal, according to Teichmüller, in the sense that any concept is universal : abstracted from its empirical data it becomes insatiable and can include any possible data or an infinity of data. As it is moreover the perspective or series in which all facts must be ordered, it may well be called the form of the inner life. But let us now turn to the critical examination of this theory.

(a) Dependence of the Qualitative View upon Quantitative Considerations.

Simple as the above statement appears, there are, nevertheless, some grave difficulties. Let us first try to understand what is meant by these time-qualities, which are to indicate position in our time series. Each immediate content of experience has indeed its duration character ; and it is this discrimination of different duration qualities of contents which furnishes the ultimate

¹ H. Münsterberg, *Grundzüge der Psychologie*, Leipzig, 1900, pp. 231-259. (See conclusion of this chapter for a bibliography.)

E. Mach, *Beiträge zur Analyse der Empfindungen*, Jena, 1886, essay on *Die Zeitempfindung*, p. 103 ff. (translated, Open Court, 1897) ; Teichmüller, *Die Wirkliche und die Scheinbare Welt*, pp. 188-243.

basis for quantitative measurement. But this subjective comparison of the duration character of contents is available only within the very narrow limits of immediate experience. The equality of certain rhythms or pendulum movements can indeed be measured that way. It is difficult, however, to see what duration quality can mean beyond the cumulative significance of immediate perception. I can not understand what the duration quality of a minute can mean; still less of an hour, a day, a year, a century, etc. What has duration quality to do with my placing the siege of Troy and the siege of Yorktown in a series continuous with my own experience? Does not the dating of these events depend entirely upon quantitative symbols? In fact, it is only in so far as we refer our experience to certain quantitative standards that we can have anything like social agreement or an objective perspective.

Moreover the duration quality of experiences as perception and as reproduced is very different. It is true, at least for larger intervals, that if relatively empty and void of interest they seem longer in passing than if full and interesting, whereas the opposite is true in recall. The sense of duration in the recall of the events of a life-time has very little to do with the sense of duration in living the events of a life-time. But, if duration quality is such a variable value as this, it can help us very little in dating. Our perspective, whether individual or social, depends upon referring our fleeting subjective experiences to certain quantitative standards. Our concept of a thousand years *means* indeed all the tingling duration values of living a thousand years; but it is in no sense a living over again of a thousand years (which we have not lived). The past duration values are not there now to tingle or supply the sense of position; and the reproducing of the experiences in a series would not mean a living over, but an entirely new set of duration values. Qualitative immediacy does indeed furnish the data for our ideal construction. Without our immediate experience of duration a century could not indeed mean a true experience to us. But the construction of a historic perspective, and dating within it, depend upon associating our experiences with quantitative processes. In discriminating qualitative time wholes and fractions

of time, as Münsterberg does, we already presuppose both the concept of time and of quantity. Yes, even in the comparison of durations we are already in the realm of quantity.

Degrees of vividness have often been made the criterion of position in the time series. Within our own individual perspective this has a certain amount of truth. But remoteness or nearness in time is not the only factor which determines quality of vividness in recall. This depends besides upon the strength of the nervous discharge at the time of the occurrence, interest or coherency in a system, repetition, etc. Thus, even within our own history, events of years ago may be more vivid than those of yesterday. And of course outside our own perspective the vividness of our recalled content can be no criterion. What has the vividness of the siege of Troy to do with its time position in history?

(b) Conceptual Analysis of Duration Quality. Its Dual Character.

So important, however, is this quality or sense of duration of mental contents for the conception of time that such a deep and acute thinker as Shadworth Hodgson defines time as the 'duration of process.'¹ The quality of duration or transition of mental states is indeed the perceptual datum without which the time concept would be impossible. But whereas for perception this datum is simple, for conceptual analysis it is not so. Obviously in this perception of duration is involved a fleeting character and a habit character. When we say duration, we emphasize the positive character, *i. e.*, the persistent or cumulative character; when on the other hand we say fleetingness, we emphasize the negative or passing character. Each character is limited by the other. The character Professor James likes to emphasize and has made prominent in psychology is the on-the-wing character of experience; our mental life is in constant flux; it is not so much a substance as a stream. But obviously if this character of vanishing were absolute, mental life could not begin to be. It is because the perceptual contents persist for an appreciable time that we can have that immediate

¹ Shadworth Hodgson, *Metaphysic of Experience*, Vol. I., pp. 136 and 137.

cumulative significance which makes a sense of real, living, warm transition possible.

This relative persistence of our perceptual contents, therefore, already points to the limiting of the negative character of the world by a positive or habit character, which makes such a thing as significance possible. Of course a purely negative world is not even conceivable. It would be unmade in the making and so could never begin to be. On the other hand the habit or duration character is equally limited; and it is because of this negation or transformation of our mental states into ever new ones that the music and continuity of mental life are made possible. In fact a world without transitions, of mere static particulars, is as inconceivable a world as that of pure negation without a habit back-ground to work upon. We not only cannot conceive of thought in a transitionless, particular world, we cannot conceive such a world to be except as itself an abstraction of thought. Transition or continuity in a purely positive or static world is inconceivable.

To be accurate in our terminology, then, we should say that our simplest perceptual datum is relative duration or relative fleetingness of mental contents. The qualification of relative, of course, is not as such *given*. This involves a conceptualizing or interpreting of our experience. It is only indeed on account of the relative stability of the conceptual system, the *Apperceptionsmasse* or the interpreting subject, that we can perceive duration or fleetingness. Were our total experience in equal flux this would make the perception and conception of flux impossible, though it would not necessarily do away with the reality of flux. Again the relativity of the conceptual system can be recognized in contrasting one system with another. The systems involving social and physical processes afford a measure for our more relative private interpretations. Thus different rates of duration and change make possible the perception of duration and change upon which our time-concept is based.

Since duration quality, therefore, involves this dual character of fleetingness and habit, which character shall we identify with time? Is not the persistence or presence of qualities for dis-

crimination and comparison an essentially timeless affair, a defiance of time, a *nach einander* of simultaneity or space, whether ideal or perceptual? Is not a transformation of values, a coming and going, a transition of contents, a making past of the present, etc., the essential character of time? It is not the persistence of the intervals or moments of the face of the watch in one glance, that we identify with time, but the continuous succession or fleetingness of values. Hence the *fleetingness of process*, not 'the duration of process,' furnishes us with the real time content. Time is indeed involved as a character in our perceptual experience; but it neither is nor could be perceived simply.

What has given rise to the confusion as regards the time character involved in perception is that the perception of time is only possible because of relative constancy, as we have already seen. For our measurement of process the constant character of experience is indeed indispensable, but the measurement or quantification of process is, as we shall see later, an essentially timeless affair, is based upon a certain constitution of the now.

(c) The Qualitative View of Time fails to give us a Continuum of Experience.

If time again is a qualitative series, how are we going to account for the continuum of experience? The qualitative experiences are as such essentially discrete and finite. But even an infinite number of discrete qualitative positions could not give us a time continuum. If the continuum of time, therefore, is to keep our discrete qualitative experiences from falling asunder, we cannot account for time as a qualitative series. Nor can we take refuge in the device of the mathematicians in regard to the number series. For entirely apart from the possibility of deriving a continuum through introducing the irrationals into the number series, we have here to do with the *existence* of qualities, not with mere hypothetical description; and the perceivable qualities are finite and discrete, when abstracted from the time process in which they emerge.

Moreover, if the *esse* of time is *percipi*, then, in the absence

of qualitative discrimination, time would also vanish, and we should have intermittent time-gaps corresponding to our own lack of consciousness of qualitative difference. This, of course, during our waking life, is a relative matter; but in the degree in which we lose ourselves in the present events and active reproduction ceases, does consciousness of duration tend to vanish. In dreamless sleep and in swoons time would vanish with our discrimination. Hence here we should have to speak of time-gaps.

But we have no sooner stated the position than the absurdity appears. As we determine the gaps in our conscious experience with reference to the time process, it is obviously begging the question to speak of gaps in time with reference to our experience. Our consciousness of process, while it is all important for the value of process, does not constitute the reality of process. The time-process, like the widely advertised cathartic pills, works while you sleep. The going on of process, moreover, during the cessation of conscious activity, is by no means indifferent to the resurrection of the world of conscious values; but is what makes the new world continuous with the old and conditions the possibility of its appearance. The continuity of experience, therefore, is conditioned upon the continuity of the time-process, presupposes that negative time-value which makes continuous transformation of the habit world possible. Whereas the gaps of experience cannot as such be reduced to terms of significance, they lead to consequences as regards the world of significance which prevent us from regarding the intervals as mere construction *in vacuo*. The world of significance before and after a night's sleep is by no means the same.

(d) The Qualitative View of Time does not account for the Variation of Duration Qualities.

Furthermore, if time is to be regarded as a qualitative series, how are we to account for the variation in quality, including duration quality? As each position in the series constantly changes its value, each position must be determined by an indefinite number of values or, in so far as we regard experience as an infinite quantity, by an infinite number of values. Instead

of having one time perspective to express the values of history, we should need an infinite number of perspectives from an infinite number of points of view. Each moment of experience, namely, gives rise to a new perspective by altering all the values of the positions in the series. As the other positions coexist in a series this means, of course, a new perspective from each point of view or position and so on *ad infinitum*. But, if the variation of perspective can only be accounted for with reference to time, it would obviously be begging the question to try to express time as a perspective. It is the infining process of time which makes all our perspectives relative.

(e) The Conception of the Infinite does not Lessen the above Difficulties.

But it might be argued at this point: "Don't allow the infinite to frighten you. The completed infinite has lost its terror for mathematics. In order to explain the character of time all we have to do is to assume an infinity of qualitative perspectives or values and thus at once have the music of the world. Furthermore we can thus solve both the problem of the continuum and of variability. The mathematicians in the case of the number series have been able to define a qualitative series as both continuous and infinite. Not only is the series of whole numbers infinite, but by introducing the fractions and the irrationals, constituting infinities of other orders or *Mächtigkeiten*, we are able to define a qualitative number continuum. All we have to do, then, is to suppose time to be such a continuous scale of values or infinity of perspectives and the problem is solved."

I dare not enter the bewildering mazes of mathematical infinity. I suspect, however, that in so far as the number series can be conceived to be continuous other considerations beside qualitative or order-considerations are introduced. It is difficult to abstract from the quantitative character of number, and, of course, in so far as we presuppose the idea of continuous quantity we are merely begging the question. An ideal exhaustion of all the possible positions as such would not furnish continuity. The continuous line is not composed of positions,

no matter of how many *Mächtigkeiten*. In order to get continuity you must introduce besides a negative value, which shall make these positions flow into each other. This is impossible, as Cayley¹ pointed out, apart from motion, and motion presupposes time. In so far as in this respect they flow into each other, they cease to be qualitative positions. Quality remains in nature discrete, and to establish continuity you must have reference to another order of reality. The qualitative diversity as such can as little be made to yield a continuum, as can a mere continuum, in the aspect of its being a continuum, be made to yield qualitative positions.

But we are concerned here not with infinities of abstract reflection or mere ideal description, but with the existence of experienced qualitative positions and with their variation. These positions are in their nature discrete. They are also at any moment a finite number. Infinity does not pertain to them, but to their variation; and it is this variation which we identify with the time character of our world. We cannot say whether the history of experience is ultimately infinite or not, though the time process must be thus conceived. Only in so far, of course, as the time process results in experience, does it give rise to qualitative diversity and perspectives. But we can say that a conceived infinity or order of infinities of ideally coexistent positions, does not touch the time character, which cannot be identified with the coexistence, but on the contrary must be identified with the variation of values. In a time world there is only one real perspective. If we choose to conceive a world of an infinity of perspectives coexistent at once we have a right to do so; only that is a timeless world and not our world. Time in such a world would vanish into the valid scale of the significance of the now. The contradictory character of such a world we shall examine later.

(f) The gravest Objection arises from the Concept of Series.

But a more serious objection still remains, which cuts the very ground from under the theory. The concept of series has been taken for granted in this discussion. This requires more

¹ *Encyc. Brit.*, 9th Ed., Article, Geometry.

careful scrutiny. Series is indeed very fundamental for knowledge or *concupi*; but it cannot be regarded ultimate as regards existence or *esse*. We cannot ascribe the idea of series to the perceptual world as such. In other words, series is not a simple datum, but involves presuppositions. Series is a purely ideal construction. This becomes clear the moment we inquire into its nature.

Series involves two aspects, qualitative difference and order or direction. The qualitative theory of time, as discussed above, has emphasized the qualitative difference and taken the order character for granted. But series is not a mere mass or collection of qualitative positions. Series involves discrimination, abstraction, comparison, etc. In other words, series has reference on the one hand to the functioning of a subject, on the other to a certain character of the content. On the one hand series as such is not *given*; it is not something in things but in us. On the other hand series could not arise except for a certain constitution of the world. We cannot conceive of series in a static world, because in such a world abstraction would be impossible; the perceptual and ideal would be inseparably agglutinated. In so far as we can conceive of such a world at all, it would be mere presence or sensation. We can abstract the ideal from the real, because reality first does it for us. It is because our percepts are transformed into memories, images and meanings which we can carry about with us in our heads, but which do not involve the sort of action the percepts require, that we can abstract, yes, even abstract in the presence of the percepts. Abstraction thus already involves a pluralistic and changing character on the part of the world. Thus abstraction presupposes time-process, a converting of sensational presence into habit or structure, functioning independently of that presence.

Neither can we conceive of discrimination in a static world. Such a world would be the mere zero of mysticism. Discrimination involves activity and thus presupposes time-process. It is because on the one hand contents roll apart or appear in varying contexts, and on the other because we can vary our attention that discrimination becomes possible. To the glassy stare of the static absolute there can be no difference; it is all

one to it. What the absolutist forgets, when he carries his discriminations bodily into his conceptual, static absolute, is that these are the results of a time experience. Discrimination, then, presupposes time-process.

Comparison and selection for a certain purpose, which are involved in the ordering of data, also involve active functioning on the part of a subject and hence are processes in time. Series thus shows, both as regards its content and its form, its relative character, its dependence upon time-process for its existence and character.

It is true that the time-series so called, or the historical series, holds a peculiar rank among series. It is prior to and includes them all. It is the registration of the time-process as such. It therefore furnishes the data for all series, as all series which are constructed are its heritage. As the registering series it has, moreover, a peculiarly factual character; it is objective to our conceptual processes, which must accept it as a datum. It is prior to reflection; and discrimination and selection are here at first the result of the evolution of the race rather than of the individual. But just because it is so fundamental it indicates, as no other series, its relativity to a certain constitution of reality. It, as no other, shows the ultimately dual character of our world. In so far as it means a *time* series, it points to a negative character of the world, which must account for its ideality and the variability of the values it means to embody. In so far again as it is a series it points to a relatively constant character of the world, namely, the habit character, which makes at least a relative record possible, and thus makes possible the world of order or significance. Time-series at any rate presupposes time-process, and thus cannot be made to define the time-character it presupposes.

It may be argued at this point, by some philosophers of the antiquarian type, that logic has nothing to do with genesis or process, but merely with nature or significance. These forget that a complete definition of nature must include genesis; that the only ultimately explanatory concepts must be constitutive concepts; that we can only know our world in so far as we can conceptually construct it. In such conceptual construction or

making of our world we find that time and habit are ultimate concepts and that all significance presupposes these.

We have discussed so far the genesis of series and have shown that it is through and through relative to time-process; that it presupposes a changing and a pluralistic constitution on the part of the world. We found that the time series as no other points to a dual character beyond it in order to explain its significance. If again we take series in its abstractness as an existent order, as already formed, this has the character of *simul* or timelessness. This is based upon a habit structure of the world, which indeed is relative to time, but in so far as existent is antithetical in nature to time. The reason that, by means of processes in time, we can relatively annihilate time is because the time-character is limited by another character. For discrimination, comparison, and ordering to be possible, the contents must be present at once to consciousness. We cannot compare present terms with non-existent ones; we cannot order that which is not there. Series thus, as involving existence or presence of both form and content to consciousness, has a character essentially antagonistic or contradictory to time. It involves that other character of the world, namely habit. Habit or structure is essential for significance, and the more complex and relatively stable the structure, the more intense and rich is the meaning. Absolute chaos would not mean intenser consciousness, as Charles S. Peirce seems to suppose; it is a mere conceptual limit, is mere zero as regards content.

The world of serial structure and reflection as abstracted from the time-subject and regarded as mere content or meaning is the type of the eternal. But the eternal is after all an abstraction from a real time-process to which its significance is relative. It is only in its abstractness that it is timeless. The eternal or the world of significance is a derivative of a habit-taking time-process and shows its relativity to this.

II. *Time as an Ideal Quantitative Construction.* — This view of time identifies time with the measurement of time. Stating the matter this way at once makes clear the circle in the definition. But the theory is so old and venerable that it perhaps deserves a closer scrutiny. It was only through quantitative

comparison in fact that time could become a social concept. Plato and Aristotle practically agree in making time 'the number of motion'¹ as measured by the heavenly orbits, though Aristotle, with his respect for common sense, cannot help noticing too its negative character. The historic perspective is surely a quantitative order and not merely a qualitative one, as we have pointed out above. Let us now examine a little more closely the notion of time as a pure quantitative construction, as Couturat terms it,² and see what it involves.

(a) What we have already said about Series holds of Quantitative Series.

In criticising the quantitative view we shall not take up the concept of order or series again. We do not hold with Bosanquet that all series are quantitative. That surely would not apply to such series as color or brightness or sound. In so far as quantity depends upon number, however, for its scale of values, the criticisms in regard to the order concept in general would apply here. We shall confine ourselves here to pointing out the relation of quantity in general to time; and if we find that the concept of quantity is derivative in character and presupposes time, then time cannot in turn be derived from quantity.

(b) Quantity depends upon Time-process for its Genesis.

Quantity arises only through reflection and comparison. In so far as it involves size or voluminousness it has indeed a basis in qualitative experience. But we cannot speak of quantity except with reference to comparison and standards. Quantity arises in stating one process in units of another process, regarded for the purpose in question as stable. It is necessitated by the social demand for description and common action. As reflection and comparison presuppose time process, hence quantity is necessarily derivative in character.

(c) The Relative Nature of the Quantitative Unit.

The relative nature of quantity appears the moment we begin to examine the quantitative unit. If quantity were absolute, it would contain its own standard or measure. But there is no

¹ Plato, *Timæus*, § 38, and Aristotle, *Physics*, Book IV., § 11.

² Couturat, article on 'Time and Space,' *Revue Met. et de Morale*, 1896.

absolute unit of measurement. All quantitative standards are relative and arbitrary. They are the result of social convenience and agreement, but have no absolute basis. The time process continually eats into our standards of measurement. This is nowhere more obvious than in our measure of the time-process itself.¹ The earth-clock is necessarily our standard clock. But the earth-clock, too, runs down, not fast enough to affect room-rent or interest, but still it is surely running down. Mr. Higgins, as quoted by Clifford, thinks that the effect of the tides is to diminish the orbit of the earth and increase its velocity, which would of course alter the absolute ratio. The present theory seems to be that the velocity is decreasing owing to tidal attraction. But this alteration is so infinitesimal with reference to our work-a-day lives that it does not practically affect them.

It is only through motion that we can obtain a quantitative unit. In a static world, where motion, comparison and superposition would be unknown, it would be impossible to speak of a unit of quantity or measurement. As quantity thus presupposes motion and time, it cannot help showing its relativity to time. But if quantity presupposes time, it is defining in a circle to define time as pure quantity.

But quantity shows its dependence upon time not only as regards the genesis and relativity of its standards, a continuous quantity cannot be defined apart from time. A continuous quantity, namely, is undefinable apart from motion. An infinite aggregate of positions cannot give us a continuum. The only way we can generate a line from a point or a surface from a line, or a solid from a surface, as made clear by both Cayley and Clifford,² is through motion. But if the definition of continuous quantity presupposes time, then to define time as quantity is obviously defining in a circle.

Moreover, time as pure quantity would be indistinguishable from space as quantitative. In scientific calculations, where we deal with time as quantitative, we simplify our procedure by

¹ Cf. E. Mach, *Science of Mechanics*, pp. 222-224 (Open Court, 1893); Karl Pearson, *The Grammar of Science*, Chapter V., § 13, 'Conceptual Time and its Measurement.'

² Cayley, article, 'Geometry' (first part), *Britannica*, 9th Ed.; Clifford, *Essays, Philosophy of the Pure Sciences*, Section III., 'Postulates of the Science of Space.'

converting our time units into space units. Thus we have time = space = timelessness, which is absurd.

(d) Relativity of Quantitative Description as Confessed by Science.

But though science may find it convenient to regard time as quantitative, it points everywhere to a more ultimate character of time to which quantitative description is relative. This is true even in pure mathematics. We have seen already that the fundamental concepts of geometry are undefinable apart from motion and therefore involve time. If we take algebra, this, too, in so far as it involves order, presupposes time. Take any simple relationship such as $a + b \times c$; and in so far as this involves that one operation must be performed before another, we have here an element which is not quantitative but upon which the validity of the quantitative operation depends. A timeless coexistence of the acts would not answer the purpose. In other words, wherever the validity of our procedure depends upon the categories of before and after, there we presuppose real time process. That number presupposes time we have already pointed out.

When we take up the sciences which deal with process, the idea of irreversibility confronts us; and the concept of irreversibility presupposes time for its definition. Energy does run down; and LaGrange, therefore, speaks of time as the fourth dimension, in which energy disappears. Tait, in his *Thermodynamics*, p. 38, in treating of the original distribution of heat, speaks of 'a certain negative value of the time for which the formulæ give impossible values'; and the same idea of the inadequacy of quantitative description leads Clifford to speak of changes as 'catastrophes.' Quantitative science, in other words, must remain hypothetical. It must always deal with a given condition of being, with a now; it cannot, in the nature of things, deal with process as such or with being which is not what it is.

If we take history in any of its phases we find that the time character is bound up with its peculiar kind of facticity and prevents us from writing history *a priori*. History is not a merely quantitative or logical system; it involves chronology, a factual order of before and after, which presupposes time.

Economics, in which some of the most brilliant analysis of modern times has been done, was perhaps the first of the sciences to discover this more fundamental character of time. Its aim from Adam Smith to Ricardo was to reduce value to terms of labor. It found, however, that value could not be reduced to mere terms of the now. Beside the element of labor the element of waiting may play an important part; and the mental attitude of waiting is conditioned by time. No amount of labor *now* could convert new wine into old wine. There is a difference in quality here, which is conditioned by a time-process. In the definition of interest the element of waiting is especially prominent.

If we take again the sciences which deal not with objective but subjective processes, the time element becomes even more obtrusive. In psychology change and novelty become especially prominent. We have discarded the notions of the 'associationists' that ideas can be poured from one skull into another as so many beads. The mental elements are nothing apart from the unitary state of which they are parts. A new state of consciousness, moreover, is not merely more of the old, but an absolutely new fact. In the irreversible process of consciousness we have direct knowledge of the time process and its ever changing values.

(e) Inadequacy of the Quantitative Conception of Time as Revealed in Time-measurement.

But the inadequacy of the quantitative notion of time is nowhere more obvious than in time-measurement itself. Let us imagine a celestial being, built upon the principles of a quantitative ideal of science, paying a visit to our empirical world and catching sight of a time-piece: 'Hello there,' he says, 'what's that?' And on being told that this is an instrument to measure time with, he asks: 'Well how much time is it?' He is told that it is one hour and thirty minutes. 'All right,' he says, 'one hour and thirty minutes.' 'No,' the terrestrial being says, 'it is now one hour, thirty minutes and five seconds.' In blank astonishment the celestial replies: "You say it is one hour and thirty minutes, and you say it is

one hour, thirty minutes and five seconds, which do you want me to believe?" 'No,' the terrestrial says, 'it is one hour, thirty minutes and thirty seconds.' 'You are a liar,' says the celestial. 'No,' says the terrestrial, 'look and see, it is just one hour and thirty-one minutes.' By this time the language of the celestial is not such as ought to be heard by mortal man, and so we will close the interview.

This strange conversation, however, has taught us something about the relativity of ideal description and its falsity when it pretends to exhaust real process. There is an impossible value, which our equations cannot express; and that is precisely the negation of any finite value and its transformation into a new. The time character involves precisely the relativity or falsifying of any description which tries to exhaust the real subject-object. Time *creeps into* our world of description and negates it.

(f) Conclusions.

We have arrived so far at the following conclusions: First, time cannot be stated as a series or order concept, because the series and order concepts already presuppose time in their genesis, and once constituted involve the coexistence of the terms within the timeless meaning of the subject. In the second place, time is not reducible to terms of pure quantity, for quantity, both as regards its continuity and the constituting of its unit, presupposes motion and motion can only be defined in terms of time. In general our result so far is that time cannot be defined as an ideal construction merely, whether qualitative or quantitative, but is somehow involved in the nature of the real subject-object — is a property or substance of the real world.

C. *Time as a Material Concept.*

I. *Time as a Real Series.* — It has been argued that if time cannot be a merely ideal construction, we can at any rate regard time as a real series or as real moments. This seems to be the view advanced by M. Bergson in his notion of a *durée réelle*.¹ This real duration is somehow to be a series of active and discrete moments based upon the principle of altering repetition;

¹ See *Revue Met. et de Morale*, article by Couturat, 1896, p. 664.

or time is to be regarded as a real irreversible series. This seems to be essentially the conception of time which Zeno of old had in mind and against which he hurled his dialectic weapons. This type of time would evidently, as we have already shown and as pointed out by Couturat, make motion and continuity impossible. M. Evellin tries to come to the rescue of the theory by assuming a zero distance between the real moments of duration. This, however, merely assumes the time-continuum and does not explain it. Were time ultimately real moments, a time-continuum would be impossible. But even if we assumed such a continuum of contiguous moments, this would make impossible any passing from one moment to another, which is just the time character. Anything like identity and causal explanation of process would be impossible, and we should have to fall back on the miraculous for any change of scenes.

Authors, who like Lotze¹ and Wundt² distinguish between time as an ideal order and an empirical succession or series, do not improve the situation much. The question arises: How is the ideal order related to the empirical succession? It is difficult to see how an ideal time, which must be regarded as an *a posteriori* construction, can in any way condition the succession of moments. But if the content of time is to be the passing of moments, then time itself cannot be moments.

But the whole notion of a real series of real moments is nonsense. There is no such thing as a *given* series or *given* moments. These are already, as we have seen, the result of ideal construction and essentially timeless.

We cannot conceive of time as serial without making both truth and reality impossible. Make time serial in character and you have this dilemma.

1. If you assume your time series to be real, then you have the coexistence of an indefinite number of real, exclusive moments claiming the same space, for each moment of time claims the whole of concrete perception with its dimensions. But reality cannot be both one and many in the same respect, hence reality becomes impossible.

¹ *Metaphysic*, Vol. I., chapter on 'Time,' p. 350, Clarendon Press, 1887.

² *Logik*, 1st Ed., Vol. I., chapter on 'Time.'

2. But if the time series is regarded as ideal, then we have an indefinite number of descriptions or judgments, each exclusive of the other and each referring to the same reality at the same point. Hence our descriptions or judgments claiming to be diverse and yet of one reality, in the same respect, are contradictory, and truth becomes impossible.

The only possible solution, as we have already indicated, is to regard time as non-serial or prior to series and to regard series as a derivative construction. Time must, somehow, be involved as a property or substance of the real, conditioning the whole world of subjective construction.

II. *Time as a Property of the Real or a Substance.*¹—We may state the difficulty in the definition of time in the form of an antinomy. J. S. Mill, in his *Examinations of Hamilton*, raises the question of how the past and the future can coexist in the present. That they do so, he regards as a fact; but how they can do so he regards as an ultimate mystery.

1. Antinomy of time.

(a) Such is the nature of time that when the present is, the past has been and the future is not yet. The present is a mere point or ideal boundary making the past continuous with the future, but is not itself time. This is the character of time which Aristotle, following common sense, lays down in his *Physics*.² This emphasizes the non-being aspect of time without distinguishing between this and the quantitative and serial characters. This gives us the mathematical present, which is a mere limit or zero.

(b) But the past and future must coexist in the present, else how can they be contrasted in judgment or mean past and future? Past and future are precisely present attitudes. Time is nothing but an ideal order. This would give us the metaphysical present emphasized by such philosophers as Kant, J. S. Mill and the idealistic school.

2. Solution of the Antinomy.

¹Substance is here used in its scientific sense, just as we assume ether for the convenience of description. It seems to me that we require a negative substance as well as positive ones in order to have a complete description of the world.

²Aristotle, *Physics*, Book IV., Section 10.

(a) The Psychological Present.¹ This view attempts a compromise between the views already stated. The present, it holds, is not mere zero, but has duration. The present and future as the waning and rising processes of consciousness really do coexist in the present within the limits of a few seconds. Beyond that they are ideal constructions. Our time judgments thus have a real basis. But this duration character must not be absolute, for in that case we should have absolute bits of duration, which would make continuity or flow impossible. The time character, as we have already shown, must be identified precisely with the waning or rising, with the fleetingness of experience. The relative duration does make possible measurement and judgments of time, but is not itself time. The psychological or 'specious present' assumes the quantitative nature of time and so fails to solve the antimony. This arises from regarding time as a quantitative series, instead of emphasizing its non-being character as its ultimate nature and regarding the quantitative and serial character as an *a posteriori* construction.

(b) Time and the Judgment. It is evident, in the first place, that time does not pertain to the individual act of judgment, *i. e.*, to the validity or meaning of the judgment. The parts of the judgment are not separated in time, though it takes time to speak the judgment. Each judgment is a timeless synthesis, involving an ideal reference or interpretation transcending the time-process.

But judgments are relative, though they mean to be true. The question arises how to account for the discrepancy of judgments, made with reference to the same point in space, in the same respect, without contradiction. We can have different judgments coexisting in regard to different points or different aspects; but how can we have different judgments on top of each other, as it were, claiming the same point? This can only be because of a certain inherent principle of diversity or non-identity in the point so that the point is not what it is, that there is negation of its being; or because a different subject is making judgments of the same identical point. We must introduce a non-spatial, negative dimension of being, a pure

¹ W. James, *Principles of Psychology*, Chapter XV., 608-610.

dynamic principle, which shall necessitate incompatible judgments with regard to reality. By incompatible judgments we mean such judgments as that the rose is red and not-red with regard to the same spatial point.¹ It matters not whether the difference is regarded primarily as creeping into the real object or into the real subject, in either case it means ultimately a different subject, incompatible with the subject or meaning claiming to be the same. All change resolves itself for knowledge into change of point of view or new experience.

We can define, then, the relation of time to judgment: Time is that property of the real subject-object, which makes incompatible judgments (*i. e.*, different judgments as regards the same attribute of reality at the same point) necessary.

Time, then, must be defined as non-being, not relative non-being merely, which has to do with difference at different points of reality, but absolute or dynamic non-being, as real and ultimate as the habit or structure aspect, which it makes relative and which in turn limits and defines it. The ultimate nature of reality must be defined as a habit-taking time-process; or, emphasizing the structure aspect, such is reality that time creeps into all our systems of truth and falsifies them, necessitating new ones.

Having once defined the real time-character, we can easily account for the serial aspect of experience as expressed in the historic series of past, present and future. These do not by their sum constitute time. They are derivatives, on the contrary, ideal constructions or will-attitudes, necessitated by the relation of the time character of experience to the habit character, and remain to the end relative. The past is the attitude toward the content which time has negated and transformed and which therefore can no longer as such be acted upon; the present is the sense of real activity or the going on of process; the future is the expectancy or attention toward the coming or new content, the field of real possibility. The irreversibility of the past, on our theory, is not ideal merely, but is due to the real negating and transforming of the world of experience for which the present past-symbols stand.

So much for the logical aspect of the problem; the epistemological and metaphysical implications will be developed later.

¹ Cp. Sigwart, *Logic*, 2d ed., Vol. I., p. 139 ff.

CHAPTER II.

TIME DEFINED IN RELATION TO OTHER CONCEPTS.

A. *Time and Space.*

Taking time as a series has led to confusing it with several other series concepts, especially with space and number. As brilliant a thinker as Münsterberg goes so far as to say that whatever holds true of time is equally true of space. Both involve qualitative positions; there are time-qualities just as there are space-qualities. In both we have the nearer and the farther with reference to a willing subject. In both we depend upon social agreement for objectivity. In drawing these analogies Münsterberg, of course, identifies time with the historic series. But just in so far as we fail to distinguish time from space, must there not be something seriously wrong with the definition proposed?

So far from time and space being identical in meaning, they are antithetical. Precisely the opposite of what is said of space must be said of time. Space involves the habit character, or the relatively permanent character of reality, whereas time expresses its fleeting or unstable character. In so far as we emphasize the spatial character of the world we have free mobility or reversibility; we can pass backward or forward over our series with entire indifference; we have absolute identity of content. In so far as we emphasize the time-character, we cannot bathe in the same stream twice; we cannot live over again a content once had; we cannot by passing through certain intermediaries go back to any content in the past, for the real qualities or points have vanished as such and been transmuted into the ever-changing present, the past and future being merely ideal constructions.

In emphasizing space, we emphasize the world of possible perception, of present or actual relationships, the world of scientific description. In emphasizing time, we emphasize the

impossibility of perception, the instability of the present, its transformation into that which is no longer, or is not yet, the indescribable, because non-existent. The two bear, therefore, opposite relations to the active subject. Space, again, is conceived as a system of coexistent series, whereas time is non-serial, is presupposed in the very possibility of the arising of series, and makes all serial description relative. Space and time, in short, express antithetical aspects of reality.

But just because they express aspects of the same reality, they limit and supplement each other. Without the negation or passing of time, space would fall asunder into discrete positions, as we cannot conceive of the continuity of space without motion. Time is bound up with the fluent or continuity aspect of our world, whereas space is bound up with the diversity or habit aspect, the serial aspect. Without the relatively stable space system again, we could have no measurement of time process, no quantitative units, and time as a negative property would be inconceivable. Whereas time therefore conditions the arising of spatial series, is involved in the *ratio fendi* of space, space as a system of relations on the other hand conditions the knowing of time, is therefore the *ratio cognoscendi* of time.

Space again as the realm of determinable relationships presupposes dimensionality. (We are using dimension here in its ordinary quantitative acceptance as referring to the number of coördinates, not in the qualitative sense employed by Teichmüller and others. According to the latter view there are as many dimensions as there are differing qualitative positions. The number series on this view would, therefore, have an infinity of dimensions. Time, likewise, if taken as an order series, would have an infinity of dimensions. This terminology, however, does not conduce to clearness.) How many systems of coördinates are required to define position in our space is a purely empirical affair and is determined by convenience in the adjustment to our actual perceptual world. As time as such is prior to series, dimension as applied to it can have no meaning. However, inasmuch as time negates any empirical system of facts, and thus continually converts real space worlds into ideal space worlds, all exclusive of each other; and inasmuch as at

present there are as many systems of significance, each filling the whole of space, as there are individual life histories, we may speak of time, though not itself dimensional, as giving rise to an infinity of dimensions by giving rise to an infinity of ideal spaces or worlds of significance.

Speaking of time as having one dimension is, as we have pointed out before, a mere spatializing of time and loses sight of the essential character of time. Speaking of time again as a fourth dimension, as La Grange does, is only excusable if we mean that time is a different sort of fact from space, and even then it is misleading. If energy disappears from space, or arises in space, it does so absolutely. Its doing so would indeed be a time fact, but would have nothing to do with a fourth dimension.

Empirical space, then, is the present system of relationships, of possibilities of perception, whereas time is the negative property which makes all systems unstable. Space as the world of description, or as a system of ideal geometrical relations, abstracted from the time process, is the eternal aspect of the world, which, however, when looked at from the point of view of significance or concretely, is ever transformed through the negation of time into a new space. Space, eternity, the *simul* system of significance, must be considered as derivative in relation to the time process, which ever looks upon itself anew under the same formal limitations.

B. *Time and Irreversibility.*

Space is often spoken of as a reversible series to contrast it with time which is spoken of as an irreversible series. But, in the first place, to speak of an irreversible series, if we emphasize the strictly serial character, is nonsense. If all the positions coexist *simul*, as they must do in a series, reversible and irreversible can have no meaning. The coming and going of contents is as such not expressed through the serial character. Reversible and irreversible apply to operation or process, not to series. Now, strictly speaking, there can be no such thing as a reversible process. This would be a process in which nothing happened. If there is activity at all, there must be a transformation of old habits and the forming of new. Absolute iden-

tity, which reversibility presupposes, is the very opposite limit from process. If we speak of a reversible process, we must remember that we are dealing with an abstraction, that we choose to neglect entirely the qualitative and time aspect of process, and deal with its purely formal aspect. Thus in speaking of free mobility in space, we disregard entirely the real diversity of the empirical world, which we leave for the physical sciences to determine.

What constitutes the irreversibility of process is that the content or habit aspect is ever transformed, and thus the old content is negated and made unreal. The reason we cannot act on the past is that it no longer exists. The past, that was, has been converted into present habits and suffused with present meaning.

In speaking of irreversibility, however, we may regard it subjectively or objectively. Inasmuch as all process is irreversible the subjective activity, or the registering and interpreting of process, must always be irreversible. But as we may abstract the social object from the subjective operation, we may hold that, though the subject changes, the object remains identical, the subjective operation not affecting the social object. Thus in the Hegelian view of the world, the system of significance or the logic of experience is always complete, yet the individual in learning it passes through a time process. Of course, thus to treat the object as an independent ideal construction is a mere abstraction. The real object, as the real subject, is a process; and though the real object may not vary in the same degree as the subject, yet the universe must be conceived ultimately as a composite, irreversible process. Our ideal constructions are indeed timeless, but only so long as we divorce them from an appreciating subject. The reflection upon an act of consciousness is not the identical act over again, but a new act including the significance of the preceding. Inasmuch as irreversibility thus presupposes process, and process involves time and habit, we cannot speak of time as irreversible.

C. Time and Number.

Those who have made time an order series have found it difficult to distinguish time from the number series. Some have

gone so far as to identify the two. If the two terms, however, embody the same meaning, then it would apparently conduce to clearness to drop one of them; it would save the uninitiated from getting confused. If, on the other hand, time and number are really different concepts, and not merely interchangeable words, then it is surely inexcusable laziness to dump them together in that sort of fashion. Discovering their difference is surely as important in that case as discovering their likeness. It is time this passion for likeness at the expense of difference became bridled in philosophy. The reason for the confusing of time and number is doubtless to be found in the identification of time with the historic series. Even so, as we shall see later, it is a loose and unwarranted way of speaking.

Those who make this identification look upon both time and number as a qualitative order constituted by the reflection of the subject upon its own activity, the subject thus abstracting from its content and attending primarily to the form of this activity. Sigwart objects to this identification on the ground that whereas 'the basis of the connection between successive periods of time is the continuum of moments which pass into each other without a break; the acts which correspond to counting are limitations of a duration which always remains divisible and cannot be produced from a combination of unities.' I agree with Sigwart that a number continuum contradicts the essential character of number. If the number steps or qualitative positions, by heaping up infinities of different *Mächtigkeiten*, can be made to disappear in a general continuum, we have obviously lost our positions and so can no longer speak of number. However, there is no danger of this happening provided we adhere to the qualitative character of number, any more than any infinities of ideal divisions of a line can be made to constitute a line. I cannot help thinking that the mathematicians lugged in unawares the conception of continuous quantity, or numbers as quantitative, and so are merely begging the question. For me, at any rate, ideal position and continuous quantity are different orders of fact and hence no infinities of one can constitute the other. The limit of the continuum, which the mathematicians seek in the case of number, is not in the same dimension with the positions that are to constitute it.

But while thus agreeing in the main with Sigwart's position as regards the discreteness of number, his statement in regard to time that 'the basis of the connection between successive periods of time is the continuum of moments which pass into each other without a break,' seems to me a hopeless jungle of confusion. If time is to be identified with numerically discrete and exclusive moments, bits of duration, on the one hand, it is difficult to see how, on the other hand, it is to account for the continuity of moments. Those who have made time identical with the number series have obviously identified it with the series of individual moments abstracted from the time process, whereas Sigwart identifies it both with the going on of process and the ideal construction of moments. If we regard time, however, as numerically distinct moments, it will be impossible to account for the continuity of moments, since the continuum, as we shall see later, presupposes time. On the other hand, if we identify time with the continuity character, with the going on of process, which makes moments relative, these moments become merely *a posteriori* constructions and do not touch the real time character. But we must take our choice between these alternatives. Time cannot be identified both with the going on of process and with the ideal or finite breaking up of the same for purposes of ideal construction.

If, however, we identify time with the discrete moments or the historic order, we find that the analogy between the historic series and the number series breaks down at many points. It is not true that each moment in history includes the significance of the preceding moments in the way each step in the number series includes the previous. Old age does not include childhood and youth in the way that three includes one and two. This is due to the fact that the number series is constructed in conformity to a voluntary purpose, expresses a formal law of the activity of the self, whereas the concrete historic series involves involuntary elements, must conform to certain objective data. This involuntary and uncertain aspect of history is due partly to the creeping in of time and partly to the pluralistic character of the world. In the empirical process no habits are absolute, but are subject to continuous transformation and effacement. In the

historic series then there is a contingent or factual element; it is essentially *a posteriori*, whereas the number series depends upon the activity of the subject, and hence, as regards its formal aspect at least, is *a priori*. True, as regards its individual character, number too involves a contingent element which shows its dependence upon a time subject. But this contingency is peculiar to the activity of the subject and is not foreign or external to the subject. We can never doubt as regards number that each step has cumulative significance, includes the previous steps, whereas applying this idea to history, as was done by Hegel, leads to the grossest fallacies.

But a more serious objection still remains. The historic series, however much dependent upon time for its genesis, as an existent system of facts, as a now order, is timeless, is the manifestation of the habit character of the world *versus* the time character. Whatever seeming analogies can be drawn, therefore, between the number order and the historic order, they fail to touch the real problem. Number as an existent order, as a *simul* hierarchy of values, is an essentially timeless affair.

It will be seen that I regard number as primarily an order series; and, conceived as an existent order, I regard it as timeless. But while the number order cannot be identified with time, it does presuppose time. Any theory of number which does not take into account its genesis must be forever unintelligible; and it is as regards its genesis that the number order involves time in a peculiar way. Now number is distinguished from other order series in that it is absolutely cumulative. This we have seen cannot be affirmed of the historic order. Moreover it is possible to conceive of order series in which the significance shall not be cumulative. Take for example the white-black series of qualitative shades. If we pass from one limit to the other, say from white to black, we are not tempted to say that the black limit in any way accumulates into itself the significance of the intervening steps. We might as well have started at the other limit as far as cumulative significance is concerned. In other words, we here abstract the order from the activity of the subject and hence can treat it as reversible in significance.

In number, on the other hand, we have cumulative significance in such a way that each step in the series presupposes and includes the previous steps. Here what we are concerned with is precisely a subjective method of operation which crystallizes into an objective ideal order. If the crystallized scale of values as such is timeless, yet it has an irreversible direction to which attention must conform. It is in this that number shows its relativity to the time activity of the subject. It is because the previous steps or acts can be retained, and each later is recognized as one more, as a new fact, that we have the basis for the number series. Mere coexisting multiplicity could not give us number. Both the time character and the habit character of experience are necessary for the number series, the habit character as conserving the steps or rhythms of activity, and the time element for the negation of the old and the arising of the new, which gives us the succession of steps and the novelty of meaning. In the number order, however, as contrasted with the historical order, we abstract from the empirical limitations of the subject and take account merely of the repetition of will acts, irrespective of the variety of empirical content. It is thus we can conceive of the absolute increase and the infinity of possible values. Number, in other words, is not merely an involuntary registration but a purposive construction.

But not only the cumulative significance of number but also its individual significance shows its dependence upon a time subject. Each step not only has a cumulative character, due to its position in the series, but also an indivisible or individual character. This is what constitutes the empirical aspect of number, so baffling to the mathematician for example when he tries to find a formula for prime numbers. This individuality of number is due to the fact that each number step is a unique will attitude or attention act exclusive of any other. As this will attitude is negated or transformed, a new attitude takes its place, each number step thus standing for a different time subject. In emphasizing thus the individuality of number we emphasize the freedom or spontaneity of the subject, while in emphasizing the cumulative character we emphasize the necessity aspect. Number, then, embodies the law of the pure activity of the subject as a time yet habit-taking subject.

Once, however, the succession of cumulative individual time subjects has crystallized into a scale of significance, once the subject has reflected upon its activity and discovered the law of the repetitive embodiment of its will as abstracted from empirical limitations, the number order becomes insofar relatively independent of time. We do not need to count to know the meaning of any number step, once the series has been established. Thus in the order 1, 2, 3, 4, etc., the steps are present in the same sense namely as ideal significance, whereas in counting 1, 2, 3, 4, etc., in counting 4 this is present in a way 1, 2, and 3 are not. In the former case we treat of number as an ideal construction, in the latter we emphasize the successive aspect, which, of course, is prior to the series or is series in the *making*. We may say, then, that number is relative to, and presupposes, time as regards its genesis; but is relatively independent as regards significance, provided, however, that this significance always bears marks of its relativity and derivation.

Attempts have been made to define the nature of number without reference to time. This, it seems to me, is involved in Dedekind's attempt to define the number series as a completed infinite. For Dedekind the nature of reflective thought as returning upon itself, as the reflection upon the reflection, and the reflection upon the reflection upon the reflection and so on *ad infinitum*, furnishes the basis of the number order. The problem of number thus becomes, as Professor Royce points out, essentially the problem of self-consciousness. The reflection upon self, however, is no more a basis of number than the reflection upon objective contents. On the contrary, the interest in ordering things must have vastly preceded the interest in subjective reflections as such. When, however, in either case the subject tries to understand number, it must be by abstracting its order of activity from the various empirical contents, toward which it is directed, whether subjective or objective. What is needed ultimately is pulses of thought, a succession of reflections which cumulate in significance as acts of one subject.

What we hold, therefore, and what Dedekind seems to neglect, is that these acts of the subject must originally be time

acts for the cumulative and individual significance of number to arise. Even if we took for granted the completed infinity of reflection, as the reflection upon the reflection upon the reflection upon the reflection * * * to infinity, this would not give us an order. There would here be no steps, since all this would be present at once, but merely the one fact. To obtain a basis for the number series we need so many individual acts of reflection, each act being transformed and persisting in the new. This is impossible except in a time process. It is the time element which negates the old and gives rise to the new, while it is the habit character which gives rise to the cumulative significance. Number, therefore, presupposes for its genesis the concepts of time and habit.

The infinity of number, moreover, as all infinity, is merely hypothetical. Empirically number is always finite. It could become infinite only if we supposed an active subject as freed from all empirical limitations. This, however, merely amounts to saying that, abstracting from the empirical limitations of its activity, the subject discovers the law or rationale of repetition which gives us the basis of number. This has nothing to do with the contradictory idea of an actually completed infinite.

D. *Time and the Infinite.*

Treating time as a series has always given rise to a great deal of speculation as to the infinity of time. There can be no doubt that the concept of infinity is closely bound up with the concept of time. Let us try to find what the relation is.

First, however, it is necessary to make clear what is meant by the infinite. It is now a commonplace to say that we must not confuse the infinite with the indefinite; and in the main it is well to emphasize the distinction, though, as we shall see later, the empirical infinite must include an indefinite element. The Greeks in general confused these concepts, or rather with them the infinite meant merely the indefinite, and hence their moral degradation of the infinite. Aristotle, however, attempts to distinguish between what he calls the false infinite or indefinite and the true infinite. The straight line is his example of the former and the self-completed circle of the latter. This

idea of formal completeness is indeed an important element in the definition of the infinite. The infinite in other words is as definite a concept as the finite. But that surely is not sufficient to differentiate the infinite from the finite. Why the circle, for example, is more infinite than the straight line I cannot understand. I suppose the reason for it must be that it is without end. That recalls a story about the Jew's eternity trousers. A Jew advertised eternity trousers and a countryman came in and bought them, supposing that they would last forever. They soon wore out, however, and the countryman brought them back complaining that he had been cheated. The Jew, however, ingeniously replied that eternity means without end, and that being the condition of the trousers, he had fulfilled his side of the bargain. But, jesting aside, the circle is just as finite a concept as the straight line. We can compare and measure circles as easily as straight lines. It is true that the circle and the straight line are incommensurable, but that would speak as much in favor of the infinity of the straight line as the circle. Incommensurability is, however, a difficulty merely in stating a geometrical relation in terms of an arithmetical. Besides, as the smallest line can be conceived as infinitely divisible, it would be infinite too on the same principle.

It is true, however, that the conception of the infinite must have formal definiteness. The infinite series of $1 + \frac{1}{2} + \frac{1}{4}$, etc., whose sum is 2, is as definite an operation as that of $1 + 1 = 2$. In both the finite and the infinite there is a law that limits the operation or determines its form. The difference between the two lies in the fact that, whereas with the finite a limited number of steps or operations will satisfy the form, in the infinite no number of operations can satisfy the form. For merely formal purposes, however, just as soon as the law of the process emerges, further operations are useless. Once having discovered through ideal construction that $1 + \frac{1}{2} + \frac{1}{4}$, etc., has for its sum 2, there is no use in carrying on the operation any further. Whereas the finite, therefore, is limited both as regards form and content, law and operation, the infinite is limited in form but unlimited as regards content, *i. e.*, no number of cases of content can satisfy the demands of the form.

Now we may choose to disregard the content and deal merely with the formal aspect. If so, we have the hypothetical infinite, misleadingly called the completed infinite. It is not that the operation is complete, but that having obtained the law of operation we deal with that purely, *i. e.*, we deal with the limit, not with the operation. Such is the purely quantitative infinite already referred to. Such would be the infinite of reflection referred to above, which Dedekind lays at the basis of the number series, or which Herbart illustrates by the map which shall also be a map of itself. The law arrived at, however, in this infinity of reflection, is the futility of the attempt to reach complete identity of the self as subject and object; we have here no approximation to a limit. The answer to our question, as brought out by ideal construction, is that we are talking nonsense. The map cannot include a map of itself; the subject cannot at the same time be object, though it must be continuous with its object. Were it possible to carry the operation to infinity, we should merely discover that the attempt is infinitely nonsensical.

Not all infinite series, however, can be regarded from a merely formal point of view. Thus the number series, as we have seen, has a factual as well as a formal aspect. Instead of abstracting here from all operation, as we do in the quantitative infinite or the infinity of reflection, we abstract here from all conditions limiting the subject's activity. The subject wills to embody itself ever anew. In this absolute freedom, however, the subject discovers a law within itself, that of habit, such that each embodiment or act shall be conserved. In this freedom of pure activity crystallizing into habit, we have the basis of an infinite order series. It is not merely the hypothetical *simul* of an infinite series, but the actual activity of the subject, successive steps of reflection. We have here, therefore, a contingent or indefinite element, which cannot be determined *a priori*, viz., the individuality of each act.

In the infinity of the historic series, again, we have limiting conditions beyond the control of the subject, which render the content or operation side entirely uncertain and enjoin the waiting for the steps, the empirical results.

The infinite in any case involves a formal law or now constitution. This is true of the mathematical limit, of the pure activity embodied in number and in history. It is because of a certain constitution that the operation is limitless or inexhaustible. This is true, I said, even of the historic infinite. It is because of the now constitution of reality that no description can prove exhaustive of it. *Now* a changing habit-taking world, *always* a changing habit-taking world. On reflection, therefore, it must present the possibility of an infinite series of facts.

To speak of infinity, therefore, as pertaining to the presented data as abstracted from conceptual construction, in the way in which Spencer does, is mere nonsense. The pure presentation or sensation is indeed a limit, which we can never reach, because from the point of view of significance it is mere zero. But the sensation as such is neither infinite nor finite. Both finite and infinite have to do with ideal construction. This construction may be in subservience to a purely voluntary purpose, as in the mathematical infinite; or it may depend upon a constitution, which pertains to the subjective activity as such in the form of cumulative habit; or it may be limited by involuntary elements, objective entirely to the subjective activity, as in concrete life or history. But in any case, the infinite only emerges as a result of ideal construction, abstracting from the limitations of our own concrete lives and purposes.

The infinite, moreover, as an ideal construction, *i. e.*, in its formal aspect, is a timeless affair. As the infinite, however, presupposes operation, it in common with all series concepts presupposes time. Furthermore, the infinite always implies possible operation, and hence implies time. It is in the very inexhaustibility of the operation, demanded by the form, that the infinite differs from the finite. This, indeed, is emphasized in different degrees, as we have seen, in the various series concepts, according as the mere form or the content also is taken into account. In the quantitative limit, once having by means of operation or experiment arrived at the law, we abstract from the time element. In the number series again we cannot do so completely, as the order and individuality here presuppose the

time-act. Finally, in the concrete historic series, we are at the mercy of time; and ideal construction is here only justified in so far as it conforms to certain data, objective to the individual subject.

If we ask then if time is infinite, we must answer that, inasmuch as the conception of the infinite presupposes time, it is begging the question to speak of the infinity of time. Whether in general any ideal construction, however, is to be regarded as infinite or finite, depends upon the limits the subject sets itself. If these limits are belief and action, individualization in short, then the concept becomes finite; if free play of purpose, irrespective of limiting conditions, then we have the infinite. Empirical reality, which forms the object of scientific research and furnishes the dimensions of empirical knowledge, is always a finite affair. Insofar as the world is empirically infinite, whether as coexisting or successive diversity, it baffles knowledge.

E. *Time and the Continuum.*

Treating time as a series, we have seen above, makes it impossible to account for the continuum. Let us try to examine now a little more closely the relation between time and the continuum. Can we speak of a time continuum? The old way of coördinating space and time as serial concepts has led to speaking of various kinds of continua, as the space continuum, the time continuum, the physical continuum, not to mention the mathematical attempt to define a number continuum. In all this there has been no serious effort to discover what is meant by the continuum as such, *i. e.*, to seize upon the essential character of the continuum. In the light of the fact already brought out that time is not serial, but on the contrary presupposed by all serial construction, it will be necessary to revise our notion of continua.

In the first place, it is necessary to point out that a valid continuum can only be obtained through conceptual construction, not through perception. All perceptual continuity, as Riemann and Clifford have pointed out, is open to doubt. We can never prove, as Clifford shows, that what appears as continuous is not objectively discrete. Thus the surface of the water

and the pictures of the vitoscope appear continuous, though objectively we know they are discrete. The continuity here is in the perceiving subject, not in the perceived object. The microscope has taught us not to rely, therefore, on the seeming as regards the continuum. Moreover, what seems continuous with our present microscopic powers may prove discrete with the intensifying of our microscopic vision. The only way, then, that we can be sure that we have a continuum, is conceptually to construct one. If you ask, then, how we know that there is such a continuum, whether it is not merely an ideal construction, we answer that this is irrelevant for our purpose; but if there is objective continuity at all it must be thus constituted. Whether ultimately we must assume objective or physical continuity or not depends upon whether we need such a continuum for our knowledge of the world and our adjustments to it. If there is, however, any such thing as knowledge of the world and interaction within it, the world must be a continuum. The continuum, therefore, is an ultimate and necessary presupposition of knowledge and action, as without it communication would be impossible whether as regards the present system of space or the now ideal past.

How, then, must we conceive the continuum as constructed? It will be impossible here to give a history of the attempts to define a continuum. All we can do here is to point out, with Charles S. Peirce, two typical positions, the Aristotelian and the Kantian. According to Aristotle we have continuity when the parts have common boundaries. This is the definition adopted by Clifford. According to Kant, again, we have continuity, when between two points, however selected, a third can always be found. In other words, infinite divisibility is the character of the continuum.

To show the futility of the latter definition one need only bring up the series of rational fractions. This series would always admit of a fraction being found between any two fractions, however selected, yet the series is none the less discrete. We can never define a continuum, however, in this analytic way. No infinity of points can constitute a line, because they are facts of a different order from the line; as ideal abstractions

they lack something essential to the continuity of the line. The plausibility of this definition comes from the fact that we presuppose the very thing to be defined and so define in a circle. Having the continuous line, for example, we can easily conceive the possibility of an infinity of positions, though we must not forget that the converse is not true, viz., that an infinity of positions constitutes a line. The Kantian definition, therefore, so prominent in modern mathematics, is a vicious circle.

Nor does the Aristotelian definition fare much better on critical analysis. If we already have a continuous quantity, then it is evident enough that parts of continuous quantity having common boundaries are continuous with each other. But if the definition already presupposes continuous quantity, then it presupposes the very thing which was to be defined, and we have another circle. Suppose we have a continuous surface. Let us divide this surface up by means of lines. Now any parts which have common boundaries, according to Aristotle, are continuous. But what makes them continuous? Is it the boundaries that glue the surfaces together? Suppose the parts were not continuous, could we by means of lines make them so? In other words, does the boundary constitute the continuum or does it presuppose it? It is evident that as no infinity of points could constitute a line, so no infinity of lines could constitute a surface. The line is a merely ideal division of a surface and presupposes the surface, hence does not glue together parts of the surface. Abstracted from the surface of which the line is a boundary it lacks an essential property of what goes to constitute a surface. Whereas the surface is infinitely divisible, no infinity of ideal divisions can constitute a surface.

The fundamental fallacy of the Kantian and the Aristotelian definitions is, therefore, the same. Both presuppose the very thing to be defined and thus define in a circle. With both, ideal acts of division are made to account for continuity, whereas infinite divisibility means merely that no number of ideal acts of division can touch or affect the continuity character. C. S. Peirce's attempt to combine the two positions is merely a double begging of the question.

What ought to be evident from the above is the futility of

trying to define the continuum in static terms. Once conceive the universe as a system of ideal abstractions, and it remains eternally discrete; each abstraction remains in its own isolatedness. The abstractions as such have no power of gluing themselves together into a continuous whole. Ideal unity, therefore, always presupposes, and shows its relativity to the real continuum. There is no such thing as a series continuum taken in its strictly serial character. To define the continuum we must look to the process or operation side of experience, to its dynamic aspect. As Cayley points out in the article already referred to,¹ if we would pass ideally from the point to the line, we must conceive the point as moved; if we would pass from the line to the surface, we must conceive the line as moved; so with the surface and the solid. Motion supplies that element which negates the discrete positions, which makes the points spread and flow into each other; and that element in motion, which gives rise to this fluency is not the qualitative, habit, or space aspect, which on the contrary gives us discreteness of position, but the negative or time aspect, which negates the various positional values. The continuum, therefore, presupposes time for its definition. This is true whether we consider the individual history or the universe as a whole.

Let us first consider the matter of subjective continuity. What do we mean by the continuity of individual history? How is the self of to-day continuous with that of yesterday? We may say that the self of yesterday has passed into the self of to-day through a series of infinitesimal changes; but we must remember in that case that the series or degrees of change are *a posteriori* ideal constructions and presuppose both the going on of change and its crystallization into habit. These ideal constructions, moreover, are based upon certain characters of the present time subject. There are no past habits. All habits must belong to the now, though, as interpreted from the point of view of the time subject, they furnish the basis for the construction of the ideal series of the past and the future according to the will attitude of the subject towards its content. The continuity of the history of the self means that the self is ever transformed

¹ Article on Geometry, *Encyclopedia Britannica*, 9th ed.

into a new self and that this transformation owing to the fact of habit is cumulative.

If the self is to be continuous there can be no such thing as a static present or absolute habit. If the present were even an infinitesimal bit or block of absolute duration the continuity of history would be impossible, and a *deus ex machina* would have to be evoked to account for the seeming continuity. We would then have to look upon history as a series of catastrophes or leaps, the difficulty being, however, that we should have to presuppose a continuum in order to make our catastrophical changes mean anything. Absolute discontinuity is inconceivable, as our discontinuities must always be estimated with reference to some continuous process.

Of course, I need not say here that the present I am speaking of is not a mathematical point or boundary. Points and boundaries, we have seen, are ideal abstractions and do not explain continuity. On the contrary, the present contains all there is of living reality, whether as data or the activity of ideal construction. The character, however, of the real subject is just to be other than itself, *i. e.*, to be a time subject. The direction and accumulation of meaning is indeed determined by the past; but the meaning itself, which suffuses reality, is ever a new meaning, which in turn thickens into habit. Time creeps into the present subject and makes its values unstable. What we have tried to show in regard to the self is that the continuous process is prior to the historic series and involves as its essential character the time-element.

What is true of the continuity of the individual self is true also of the continuity of the world as a whole. It, too, can only be conceived as continuous by being considered as a history or process, by being absolutely transformable. The problem here, however, seems more complex, as here we seem to have absolute coexistence as well as history. This is only true, however, from an abstract and partial point of view. It is true indeed that, try as we may, we cannot help recognizing an original diversity of habit-taking in the universe. But what prevents this diversity from destroying the continuity is the transmutability of each diverse habit structure in the process of the

whole. This process indeed transforms each structure differently according to its own inherent character, but nothing remains static. If there were any such thing as absolute bits of stuff, absolute habits, then indeed the continuum would be impossible; but such atoms are the result of abstracting the diversity character from the process which owns it. If then we start with the universe as an exhaustive system of ideal positions, as mathematicians conceive number, we must conceive of these positions as spreading or moving into each other to have the continuous world. Each point of diversity thus describes lines or spreads waves that make it flow into all other points. It must be remembered, however, that these points are not mathematical points but physical points or real contents; and the lines or waves described in all directions are likewise physical. Thus the universe as a whole must be conceived as an infinite multiplex of infinite histories, all transmuted, however, and made continuous in the process of the whole. We can thus travel on the sunbeams in either direction, as Sylvester suggests, because each wave flows into the next wave, each wave embodying the history of an infinite past.

For various purposes of knowledge we indeed emphasize differently the various aspects of this process, as we try to show the empirical relations between these spreading centers of reality. Thus, for purposes of chemical analysis, it is the diversity or habit aspect that interests us primarily. Hence the atomism of chemistry. In physics again, as in accounting for light, radiation and gravitation, it is the continuity aspect which is of primary importance. Hence the perfect fluid and perfect jelly hypotheses here. Newton's first law of motion, likewise, abstracts from all diversity and resistance and treats the world as a pure continuum. These hypotheses, though one-sided, have their serviceableness in their own domains. The ultimate hypothesis of reality, however, cannot differ for different sciences, but must include both the diversity and the continuity aspects, both the atomic and the fluid hypothesis. An attempt to form such an hypothesis is the vortex theory of Lord Kelvin and the squirt theory of Karl Pearson. However unserviceable these theories may be in their present form, they aim at any rate at a concrete statement of reality as a habit-forming time reality.

If it is asked then if time is continuous, we must answer that inasmuch as the continuum presupposes the negative property of time, time as such cannot be spoken of as a continuum. Again, to the question how many continua there are we would answer that ultimately the historic continuum is the type of all continua. Spatial continuity, too, must ultimately be derived from process or history.

F. *Time and Causality.*

The close relation between time and causality is recognized by all great modern writers. The boundaries, however, have so far been imperfectly defined. Are the two identical or reducible at least into terms of each other?

There has been great difficulty in the past in keeping the causal category distinct from other concepts in which it tends to merge. This is not an accident, but is due to logical implications. Among the concepts involved are especially time, substance, necessity, chance, sufficient reason, reciprocity, freedom and individuality. It is not our purpose here to unravel all these interrelations, though perhaps this brief analysis may simplify the case somewhat.

Perhaps the root of the difficulty after all lies in the failure to distinguish between causality as involving real process and the ideal interpretation of cause and effect. Perhaps there is no concept in which the inner struggle between the ideal and the existential aspects of reality is more intense than in the concept of causality. This is shown in the very difficulty of keeping it distinct from the time concept on one hand and the concept of substance and the sufficient reason on the other.

The difficulty may perhaps be stated in the form of an antinomy:

1. Cause and effect must be distinct or different, if in nothing else at least in position, as in purely mechanical displacement. Suppose cause and effect did not differ, then nothing could have *happened* and it would be senseless to speak of cause and effect. There would simply be the same identical fact or truth. Therefore, in so far as the terms cause and effect have meaning at all, they must be different. The effect

must somehow be a new fact. There must be real process in the world.

2. Cause and effect cannot be distinct either as regards position in space or as regards the before and after, nor can they differ in any other manner. For suppose they differed in position, that namely the cause came before the effect. They would simply be two different facts. Suppose, furthermore, that they should differ in any other manner, whether qualitatively or quantitatively, in so far as the effect differs from its cause, it cannot be caused by it, and we have been mistaken in regarding it as cause. Therefore in every respect cause and effect must be identical.

The second part of the antinomy is the only one that is likely to satisfy the mind for which mechanical simplicity or logical unity is the ultimate category. Here at least mathematical mechanics and absolute idealism, monistic materialism and monistic spiritualism join hands.

Mechanics tries to resolve everything into equations of masses in space. Mass and position alone remain as fundamental. The before and after are dismissed as irrelevant. Given the position of any particle (according to Clifford) and the whole infinite past and future must be determinable from that. Knowledge must be knowledge of relations. "As it was in the beginning is now and ever shall be, world without end. Amen." That the mechanical account is not adequate to the real character of the world is acknowledged by no one more candidly than by Clifford, Taite, LaGrange and other physicists. Just because the mechanical theory takes account only of now relations, its account is valid only with reference to an abstract stereotyped now. For moving reality we have the instantaneous conceptual photograph. The real process, on the other hand involves a series of nows, different strata of being outside of which the equations talk nonsense. The great physicists, therefore, now realize the difficulty of making conceptual shorthand do service for real process by all sorts of figures of speech, though of course, insofar as we have a science of mechanics, it must be based upon identity of relation, and causality for it must be translated into terms of the law of conservation of energy and spatial reciprocity.

Perhaps the law of gravitation furnishes the most perfect example of the modern attempt to merge the category of causality into that of reciprocity. Ever since Newton's time equations have done the service of explanation. Determination of masses and distances seems to have made time and causality in the old sense superfluous. Reciprocal relations are everything. But here, too, the inadequacy to explain real relations has been recognized by the physicists. Even if the physicists for the present must be satisfied with such equations, it is not because they are satisfactory. The various theories, such as the famous vortex theory of Lord Kelvin, the squirt theory of Karl Pearson, etc., are attempts after all to substitute a causal or dynamic explanation, however complex and difficult to accomplish, for mere static equations of reciprocity.

Nor can we get rid of the difficulty by trying to reduce the category of cause to the category of substance as in the modern idea of transmissive function as opposed to productive function. The various substances of science are regarded as related to each other as condition or occasion. The match is the occasion of the explosion of the gun-powder. One rearrangement of atoms is the occasion for another rearrangement. This in our ignorance of real relations may be a convenient way of speaking, but it can hardly be regarded as a solution of the difficulty. Old fashioned philosophic occasionalism at least recognized the miracle. Nothing short of preëstablished harmony could make occasionalism workable, whether in the relation of mind and body, or in the interaction of material substances. This simply shows, however, how the old category of real causality breaks out in spite of all our abstract working tools, yea rather because of them, in that they furnish us with certain limits with reference to which we can measure the flux of the world.

If in mechanics the category of causality has had such a hard time to hold its own against such static concepts as the conservation of energy and reciprocity, as expressed in terms of mass and position, still more danger has it suffered from the idealistic attempt to merge it in the concept of sufficient reason. Bosanquet expresses the general sentiment of the absolutist idealists when he says that causality is an imperfect category,

one which demands completion and when completed becomes lost in the sufficient reason. The relation of antecedence and consequence must give place to explanation by inner connection or position within a system of significance.

Thus according to idealism, causality forms a sort of unstable middle ground between mere time-sequence on one hand and explanation within a purposive whole or system on the other hand. In causality we have more than sequence, we have at least external determination, which, however, to become significant must give way to inner connection. The real world is one significant, complete whole, in which there can no longer be any successive or external determination, but each fact is seen to be the individual embodiment of a purpose. Succession and causality are due to our finitude in apprehending the complete experience. Hence the real world does not acknowledge them. That the real world must be known *sub specie æternitatis* is common to Spinoza's substance and Hegel's absolute. In either case inner necessity or connection has appropriated antecedence and consequence. Does this afford a final solution?

Here no more than in the case of mechanical reciprocity does the solution meet the demands of the real world. Of course just in so far as we aim at logically satisfactory explanation must we aim at just such a closed system as the one absolute idealism proposes. The question is: Does the real world permit of such a closed system? Can time be so completely excluded? Our whole discussion of the time concept shows this relativity of our system of significance with reference to the time process. What, then, must be our final answer as regards the relation of the categories of time, causality and sufficient reason and what solution can be offered to the antinomy with which we started?

First, then, what is the distinction between time and causality? We cannot agree with Kant that some time-sequences are not causal. If you take his illustration of the perception of the flow of the stream and the perception of the parts of a house, it is evident that Kant has mixed his causal series. If you take the point of view of the spectator in both cases the distinction will vanish. The series of perceptions in either case can no doubt be reduced for psychological purposes into a causal order.

If you again look at the objective side, the house for dynamic science is only a more complex causal nexus than the stream. But neither can we on that account take the position, which seems to have been taken by Schopenhauer, that the two categories are, therefore, ultimately identical. The concept of causality involves besides more or less explicitly, as Sigwart points out, the idea of connection. It implies that absolute chance does not rule to such an extent that there can be no uniformity or verification of expectancy. Causality, therefore, implies the concept of habit as well as that of chance or time. Not habit merely on the part of the observer as Hume would have us believe, but such habit or uniformity on the part of nature as realizes expectancy. And here is where the tug of war begins. Make uniformity or law absolute and the time element vanishes. Causality becomes lost in mechanical reciprocity or ideal system. Such absolute uniformity, however, would make consciousness, which has evolved in response to the need for adjustment to the ever growing complexity of its environment, impossible. If again you emphasize the chance or time aspect, you make any uniformity, law or necessary connection impossible. Hence causality has again disappeared.

Causality, therefore, is a complex category and has reference at the same time to the process aspect of experience and to the uniformity or truth aspect. It is light enough to enable approximate adjustment to the growing environment, but dark enough to prevent the reduction of experience into a transparent system of ideal significance. Its uniformity is only a relative uniformity, except when it is hypostatized as a logical abstraction, when it must be treated as are all convenient relative abstractions.

Causality, then, marks the struggle of the self to synthesize or unify the process of experience. It succeeds in this attempt at unification only at the expense of ignoring the very process aspect of experience which it *means* to explain. Causality thus ceases to be real causality and becomes a timeless category, but the inadequacy of this category to cope with concrete experience, grows everywhere apparent. Causality to the end *means* to deal with real process ; and, as long as the universe remains a

universe of process, the 'imperfection' of antecedence and consequence, of change and expectancy, must be a necessary part of the meaning of causality. When chronology vanishes into the determination of logical system, then and not till then will causality become superfluous.

When causality is viewed from within, becomes conscious in a self directing individual of a purpose which it aims to realize, we call it will. Here again the old struggle between law and uniformity, on the one hand, and chance and the time element on the other, breaks out afresh in the problem of the relation of character (habit or uniformity) to self-determination or freedom (chance or time).

G. Time, Chance and Necessity.

In the preceding discussion we have sometimes used time and chance as interchangeable terms. This makes it necessary to say a word about chance and its relation to necessity.

Chance is sometimes used to indicate a subjective attitude of ignorance, when the facts themselves are regarded as determined. In cases where we apply calculations of probability we are ignorant namely of part of the facts or connections, and this makes it impossible to anticipate or state with certainty the behavior of any one fact within the system. We, therefore, make a disjunction of possibilities with reference to such knowledge as we possess. As chance in this case is only a name for ignorance and has nothing to do with facts, conceived as objective, we may pass it by.

Chance again is sometimes used in regard to matters of fact as opposed to necessary connection between facts. That the universe is this individual universe and no other, that it has just this variety of qualities cannot be accounted for, but must be accepted. In neither of the above cases, however, does chance have anything to do with the time problem.

But there is a more real meaning of the term, and that is where chance is identified with change or process. Where we are the most familiar with the problem of chance is in human volition. If it is possible for a human being to decide otherwise than he does, then here at least we are confronted with a

reality which cannot *now* be definitely determined and in regard to which disjunctive judgments at most are possible, no matter from whose point of view. Human freedom is one case at least where we become acquainted with chance.

Real or ultimate chance, therefore, means absolute novelty in the universe, whether in the realm of nature processes or in conscious willing. Wherever there is real process, where events happen, there we have chance. Time and chance used in this ultimate sense are identical. Time has already been defined as that element in reality, which makes all our descriptions relative; and that is precisely what we mean, in the last analysis, by chance.

But what, then, is necessity? Is it true, then, that chance is objective and necessity subjective or vice versa? Neither is true. Both are subjective meanings and both must have their basis in social experience. Necessity pertains to the facts of experience, in as far as they can be systematized. Now in order for the facts to be systematizable there must be uniformities in experience. There must be agreement, too, in the unifying activity of various individual consciousnesses, *i. e.*, there must be social unity. In so far only as there are social uniformities does necessity have an objective basis. In so far, again, as these social uniformities are after all dependent upon individual processes and are mere abstractions apart from these, — in so far must necessity be limited by chance.

Causality thus affords a synthesis of chance and necessity. In so far as causality has reference to that aspect of experience which makes continuity of structure and, therefore, uniformity or predictability within the process of experience possible, it partakes of the category of necessity. Because our world is a habit forming world, each moment of experience must involve a certain identity with preceding moments, making possible retentiveness, associations and concepts. Each moment, then, will be seen to be an outgrowth of its past, whatever the changes or chances may have been in the making. These expectancies are construed into systems, an ideal network, in the meshes of which we strive to catch the processes of nature. Only that this network is not ready made, but is an outgrowth of the ad-

justment of a conscious organism to an environment upon which it is dependent for the satisfaction of its needs. It may be, however, that tendencies or physiological dispositions are established as a result of race experience which, as the nervous system matures in the individual, facilitate such a taking account of uniformities, even though these dispositions cannot be regarded as innate ideas, or even innate feelings.

On the other hand our knowledge of the world, whether in the form of the chaotic predictions of common sense or the more systematic predictions of science, is always limited by the other aspect of experience, namely, that it always is in the making, that our predictions must be readjusted. Absolute uniformity on the part of the individual consciousness is acknowledged by all to be out of the question. Finite consciousness is admitted by even the Hegelians to be a process, and inasmuch as the most important part of the world, to which we must adjust ourselves, the only part we can be said to really know is made up of individual consciousnesses, we at any rate must always find our knowledge limited by process and chance.

From what has been said it is evident that we cannot speak of a *a priori* necessity or a *a priori* law or uniformity. Necessity pertains to the world as *made*, not to the world in the *making*. It would be more proper, therefore, to speak of an *a posteriori* necessity than an *a priori*. It is only as we abstract from process, from causality out of the future, to use Professor Palmer's phrase, that we can apply those categories of identity, which the self in its social relations has found so useful in describing its world and formulating common plans of action. Real process or real futurity lie alike outside the field of scientific description. Necessity is the result of the projection of present demands or ideals into the world of experience,—demands for unity and wholeness which are alike essential for any meaning or knowledge, and alike unrealizable in a world where real time or chance is a factor. This continuous readjustment of a changing self to a changing environment seems, however, indispensable to self-consciousness; and absolute logical unity or necessity, if reached, would prove suicidal to the very ego that posited it as a limit in the interest of the ongoing of its own activity.

CONCLUSION.

Utterly as the serial view of time fails to furnish a definition of the real time character, it yet contains many interesting suggestions. The time character is, however, bound up with the coming and going of contents, with their appearance and dying away. This relative duration character or, what would be more to the point, this relative change character of contents, this transitory character of the mental life, is indeed what gives us our perceptual datum of a time world. But for logical analysis this is obviously not a simple character. The relative duration or relative fleetingness implies two antithetic tendencies on the part of reality. If we express this simplest fact of perception as relative duration, this implies that the duration or habit character is limited by another, a negative character, which is continually creeping into the former and eating away its hold. On the other hand, if we say relative fleetingness this points to the fact that the negative aspect is limited by a positive, which makes possible a world of cumulative significance, makes each dying moment die gradually, instead of being extinguished at once, and thus sing its swan song to the rising moment. Where the mistake has been made has been in failing to distinguish this dual aspect, this time and anti-time aspect, of the simplest possible concrete experience and treating that which is perceptually simple as also conceptually simple. Conceptual analysis alone can discover those ultimate characters which shall make a consistent description of our perceptual world possible. Any half way analysis must ultimately land us in hopeless contradictions.

If we are to define time, moreover, we must take care that time does not get lost in its contradictory or not-time. This must be the result if we attempt to define time as series. In a series the positions must exist *simul*. The positions, that have vanished or are not yet, obviously can be no part of the series. But it is precisely with this vanishing and coming, in relation to an attending subject, that we connect the idea of time. A world in which all the positions should coexist invariably to the fixed gaze of attention would indeed be our conception of a timeless world. Time, so far from being itself explicable as a series, is that character which belies or makes relative all series

or static descriptions, when these attempt to be exhaustive of concrete experience. Series, then, cannot be made the *ratio essendi* of time without losing time in its contradictory.

Series, moreover, presupposes, as we have seen, the time character as part of its *ratio fiendi*. It presupposes time and diversity of habit for its arising, and shows through and through its relativity to these characters. It is the time character which alters the value of the positions in the series and thus makes our task of describing reality an infinite one, *i. e.*, makes all our descriptions relative. This derivative character appears in all our series concepts. Whereas number, for example, as an existent series, as a graded scale of significance, is timeless, yet numbers can only arise through counting, through the reflective attention process of a subject, each step crystallizing into significance and accumulating into the next. It is time, negating each step as such and giving rise to a new one, that gives us the individuality of number and the crystallized scale of values. Such an accumulative order could only arise as the result of a time process. Space, likewise, shows its dependence upon time, as except for each position passing into the others we could have no continuous space. The infinite finally is nothing but the abstracting of the relativity of our experience as time activity. While series, therefore, as existing significance is timeless, it shows through and through its abstractness and its dependence upon the time character for its becoming.

If series, however, cannot be made the *ratio essendi* of time, it is evidently its *ratio cognoscendi*. The negative or fleeting character of time could not be discovered except with reference to a relatively stable system of meanings. It is because our serial description proves relative that we are forced to take account of the negative character, which falsifies all our descriptions. It is serial construction which makes possible a graded scale of values and therefore measurement; and it is with reference to our relatively stable quantitative standards that we can ascertain the fleetingness of our own subjective processes.

In concluding the present discussion, however, I wish to add that in showing thus the relation between the concept of time and the concept of series, I have touched the root of the diffi-

culty as regards the time concept. Make the concept of series prior to the concept of time, as philosophers have agreed in doing up to date, and it becomes impossible to define either time or series without a hopeless circle. Make series again derivative or secondary and the hitherto baffling paradoxes of Zeno vanish. If time is taken as a series, then even an infinity of positions would not alter Zeno's difficulty as to the definition of the flying arrow. For if time is an infinity of coexisting positions then the arrow would have to be at an infinite number of positions at once, which is contradictory. The problem of continuity, moreover, would still remain. Since even an infinite number of points could not give you a continuous line, how could the arrow get from one position in time to another? It could never begin to move. If the serial positions, however, are *a posteriori* abstractions, our ideal construction, the pictorial habits of our brain, they will not interfere with the flight of the arrow. It becomes obligatory no longer upon the arrow to pass from one static point to another in our conceptual system, but upon our conceptual system to discover its relativity, its inadequacy as static to exhaust the perceptual world.

But Zeno himself and all the rest, who have inherited his abstractions, have presupposed time in our sense in order to make their abstractions mean anything to them. Process is prior to ideal construction and our ideal divisions of process do not affect the real nature of process. An infinitesimal rate of motion is still motion. On the other hand, no infinities of static positions of however many *Mächtigkeiten* can give us process. Our ideal divisions and serial constructions are facts of a different order from the going on of process. They may symbolize process to us, but they cannot constitute process. They remain to the end derivatives of process, whereas time is the dynamic element in process itself.

The antinomy, as to whether time is finite or infinite, vanishes equally, when we once recognize that time is prior to serial construction. The concepts finite and infinite have meaning only within the world of ideal construction. Neither has anything to do with facts as facts, with the *given*. Whether ideal construction is regarded as finite or infinite depends entirely upon

the limits which the active time subject sets itself. If its purpose is belief and action, its construction is finite, limited by all the real conditions of a changing and a pluralistic world. If its purpose is merely free construction, the free play of the idea, it can construct infinities to suit itself. The historic series indeed can be regarded as an infinite series of changes, a real infinite; but it is regarded thus, not because time is serial, but because time is a character of reality, pertains to the ultimate constitution of our world; and this constitution remaining what it is, we cannot conceive of the world as otherwise than changing, *i. e.*, we can conceive no end to history in the abstract, though our own purposes are finite and limited. Explanation has nothing to do with beginnings or first causes, but with constitutions, with operating conditions. We are not concerned, like the ancients, with creating a world, but with finding out its nature.

We must agree, therefore, with Kant that ideal construction presupposes time as a datum; the time flow must be conceptualized or interpreted into a system of meanings. Again, it is because of the relativity of the system of meanings that the time character itself is ascertained. Hence from the point of view of knowledge the ideal system is prior, though from the point of view of belief time is prior. As against Kant we have pointed out that series and order themselves involve ideal construction and hence presuppose time as a datum. What remains as the ultimate time character is pure negativity, not non-being as an empty ideal abstraction, indistinguishable from equally abstract being, as with Hegel; nor relative non-being in the sense of mere otherness, other being; but non-being as an ultimate aspect of reality, a dynamic principle, negating the habit structure of the world and transforming it into ever new structures.

CHAPTER III.

TIME AND BEING — A SURVEY OF ATTITUDES.

A. *The Timeless.*

In order to understand better the function, which time fills in experience we will begin by abstracting from time and regarding reality as a timeless system of truth. Such a world is of course for us as time-subjects a mere hypothetical abstraction. All we can do is to abstract from our time-experience as we have it, and conceive it as it would be with time eliminated, given for the time being our distinctions as arisen by virtue of the time-process.

Such a world would be a world of abstract dialectic, such indeed as McTaggart conceives the Hegelian world to be; a dialectic silent as the dance of the deaf; a dialectic without movement or variation of attention, for ideal motion, Trendelenberg to the contrary, is a contradiction in terms; a timeless viewing, where all the stages or ideal moments exist for consciousness at once, and have their fixed setting in an ideal scheme, where reality is included and exhausted in one self-complete and infinite definition, the *Idè*, the Absolute.

If we have recovered our breath, after speaking such magic and potent words, let us see what place certain categories would have in such a world. The concepts that would have to be re-translated especially in such a world are the dynamic concepts. Take for example the concept of motion. Just think of defining motion as an infinite number of intermediary positions existing 'simul' for a subject. While you may thus shirk Zeno's problem as to where a body is when it passes from one position to another or how positions can be made continuous, by denying any passing whatsoever, you raise a still more serious problem as to how a body can be in an infinite number of positions at once. In other words such concepts as motion or change would be meaningless in such a world.

Causality in such a world would have to be translated into terms of sufficient reason or logical system. Cause and effect would be identical and both terms would have to be dropped out of the vocabulary as superfluous.

Attention, in such a world, could be merely the convergence of an ideal system, would have to be expressed in terms of significance. It would be the complete meaning or the consciousness of the whole of itself. Variation of attention would of course have to be ruled out. That the qualitative discrimination, assumed in such a world, presupposes variation of attention and, therefore, time is ignored by the advocates of the static view. We, the abstracting time-subjects, have these contents present to us, and, therefore, can make a timeless synthesis of them.

Activity in such a world would have to be translated, as Spinoza does, into adequate ideas or complete logical definition. Possibility or impossibility would, of course, be equally meaningless, where there can be no creation out of a contingent future.

Past and future in such a world would become mere attitudes on the part of a willing subject. But the meaning has dropped out of both of them, they are mere words, 'sounding brass and tinkling cymbal.' What could the attitudes of pastness and expectancy mean, where nothing happens?

Non-being in such a world could only mean that one fact or form of being is not another, and the assertion of identity could hardly be made when no question or doubt is possible. It is the seeming flux of things that makes us demand identity. To be honest at all in such a world we should have to eliminate at least a good deal of our vocabulary and the corresponding concepts and judgments.

When, however, we keep in mind that the icy grandeur of this static fabric is the result of our own abstraction and ideal construction, there can be no danger of being led astray. It is, on the contrary, altogether proper to try the logical experiment of elimination for the purpose of discovering the value and interrelation of our concepts. Abstracting certain concepts from concrete experience only keeps them in abeyance (*aufheben*), it does not destroy them. We have all the while in the back-

ground the inner wealth of concrete meaning, which gives value to our abstractions.

If, however, we take our timeless construction seriously, if we hypostatize it into a world, as so many philosophers have done, we shall land in hopeless contradictions. In a really timeless world, in a world of no activity and no process, there would not only be no dynamic judgments, but no judgments at all. As far as we know at any rate the arising and development of consciousness would be impossible except for the ever present necessity of adjustment on the part of the organism to a complex and changing environment, in order to realize its needs. Concepts are developed as tools by means of which we may be able to seize upon the relatively permanent in the fleeting changes of things and thus anticipate the future. The psychic content becomes detached from the perception, because the perception has disappeared, and the psychic content thus torn loose becomes symbolic for the reflective subject of all similar situations. Without time process, therefore, we should have no meaning, no judgments; we should have simply the glassy stare of the mystic one, which again is nothing except for our choosing to posit it.

All description indeed must be abstract and timeless. Description too is necessary for the highest possible coördination and adjustment. Without description, social coöperation would be well nigh impossible. There are two dangers, however, that we must guard against.

One danger is that of being satisfied with an incomplete and provisional description. While description is not reality, it should furnish us with symbolic equivalents for reality. The timeless description above has made absurd the facts it was invented to make intelligible. But a description which lands us in hopeless contradictions is obviously a failure. We must look again for the elements which we have missed. We must have faith that the universe is amenable, at least, to consistency; and seeming contradiction must be a challenge to us to revive and complete our ideal network of symbols.

A second danger lies in the tendency to hypostatize our description as reality. This has been the danger alike of idealism

and realism in the past. Democritus hypostatized his hypothetical atoms, and Herbart his qualities, no less than Plato his impersonal ideas and Hegel his Absolute. We must not forget that reality at heart is individual and that, however far we may carry our conceptual analysis and synthesis, it can never exhaust the 'acknowledgment' of unitary wholes which only will and appreciation can create for us. This individual core of being must always remain a limit toward which description approximates, but which it does not reach. The conceptual function, in other words, must regard itself as the instrument by means of which the willing and appreciative self strives to become conscious of itself and to realize itself. It is not an end in itself.

The real is the finite, the fleeting and perishable, the permanent is the shadow or symbol.

This is but his shadow,
His substance is not here,

may be said of all our ideal abstractions. This means a reversal of the idealistic emphasis from Plato down. Instead of

Alles Vergänglicher
Ist nur ein Gleichness,

I would say that the eternal or conceptual is only a poor copy or symbol of real life.

Grau, teurer Freund, ist alle Theorie,
Und grün des Lebens goldner Baum.

With this introduction it devolves upon us now to seek for the missing element, which may free our above description of reality from its contradictoriness. If it will not do to eliminate time, what function does time play in reality? In order to get the problem before us we shall examine

B. Some Metaphysical Attitudes in Regard to Time.

In doing this we shall not try to be exhaustive. That would involve writing a history of philosophy. We shall select them and group them as may seem helpful for the understanding of our problem.

1. *Time as Illusion or Mere Appearance.*—Let us begin with the attitude which makes a sharp separation between the time world and the timeless, the latter always being conceived as the real. This view affords no place for history and does not attempt to give any significance to process. The timeless conceptual world *is*, the world of process and change is not, is degraded to mere appearance or illusion.

Vedantism recognizes only the reality of Brahm, the one changeless, indivisible, unnameable. All change and multiplicity belong to the world of Maya or ignorance. To attain reality we must lose self-consciousness in mystic ecstasy or hypnotic sleep. Vedantism is consistent at any rate in so far as, in denying process and multiplicity, it also denies judgment and ideas as possible from the point of view of the real.

But we find this sharp contrast also in various western systems of philosophy, both realistic and idealistic. Perhaps it is first brought into sharp relief in the naïve materialism of Parmenides. Only being is. Non-being is not. Being is one and identical. Here the demand for identity is first made an ontological principle. Process and change have no reality. They seem, however, to have reality to the vulgar and uninitiated, and for the benefit of those, who live in the world of opinion, the followers of Hereacleitus for example, Parmenides adds the second part of his famous poem.

Zeno, Parmenides' brilliant pupil, by means of his ingenious paradoxes, makes short work of the current notion of an ontological, serial time. The serial idea of time we have discussed already sufficiently. Suffice it here to say that if time were serial, Zeno would be right that it could not be real, and all attempts to answer him on his own ground have proved futile. Because Zeno's definition of time makes time contradictory, he draws the conclusion that, therefore, time and process can have no reality.

Plato, in the Parmenides especially, adopts Zeno's weapons. Thus if serial time were objective, the world could be proven both older and younger than itself, etc. The most characteristic note in Plato, as we find it especially in the seventh book of the Republic and in the Symposium, is that the world of process

and change is a world of shadows. The reason must rise above the flux of the world of perception and feeling to grasp laws and institutions, and only as finally, through dialectic, it beholds the eternal ideas of truth, beauty and goodness has it arrived at the real essence of things.

In Spinoza's Ethics we meet the same sharp separation between the time-world and the real world. Time, as the sense of duration, pertains to the modal aspect of the world; and therefore, things, in so far as they involve duration, have only an indefinite existence and our ideas of them are confused. In so far as we come to have adequate ideas of things, we see that they are necessitated by the constitution of the infinite substance, by their place within the eternal system of things. What the relation is of the infinite mode of motion to this eternal point of view, Spinoza does not try to show, but evidently the former is a concession again to the confused and partial world of opinion.

With Kant the subjective character of the serial time notion with which he deals comes to consciousness and influences radically his whole theory of knowledge. It is because the mind is obliged to fit its given data into its *a priori* serial forms of time and space that it is forever shut off from the world of reality. The long list of Kantians ever afterwards, whether they have regarded reality as a system of thought with Hegel, or as atomic qualities with Herbart, or will with Schopenhauer, have adopted essentially at least this formal point of view of time.

It is impossible to keep the two aspects of experience, the temporal and eternal, in two different compartments, however air-tight we try to make them. Time has a subtle way of creeping into things, even the eternal world of ideas. Calling a thing an illusion or opinion or appearance, moreover, does no longer free us from the responsibility of accounting for how an eternal, static system could produce the illusion or appearance. A universe, which should have such a capacity for lying about its character, would make one mistrust any efforts at knowledge.

What gives such plausibility to this timeless view of the world, in spite of violating all the facts of experience, is the

ingenious shifting on the part of its advocates from one point of view to another. If you corner them in the world of fact, they graciously admit that the facts in the world of perception seem to be that way, that so it appears from the finite point of view, that the common herd, living in the world of opinion, knows no better; but then, instead of trying to account for appearances, by some magic trick they disappear altogether, only to reappear in a different dimension, speaking from a different point of view, in a new rôle, whether they call it Brahm or substance or the world of ideas or the absolute or reality, or whatever other name this new rôle may be given.

In the end we shall find that this account of experience has done great service by bringing into sharp relief the dual aspect of the world as a world of process and activity on one hand and a world of truth on the other. They are right, too, in maintaining that the conceptual aspect is the eternal and permanent aspect. That the multiplicity of fact and the fleetingness of process can somehow, approximately at least and for purposes of expectancy, be reduced to concepts of unity and substance, has been the inspiration of science, which always has a strong tendency toward Platonism, to regard namely its symbolic generalizations or conceptual shorthand as the essence of things. The atoms of the chemist and the ether of the physicist are apt to seem to them far more real than the perceptual facts which they are invented to explain.

But the Platonists, while emphasizing the importance of the conceptual aspect, have been and will always be wrong in denying the reality of process. While science may have no use for process except in so far as it can be reduced to static categories, yet *a posteriori* the time aspect will always make itself felt and make ridiculous the eternal dogmatism and security of the theorist. It is because truth is not independent of process, but is ever striving to symbolize activity and life, that we have that *negativität*, which makes ever larger insight possible. The *negativität* of truth, in other words, is not to be sought in truth as such, but in relation to the demands of a developing self.

2. *Time Derived from the Timeless, a 'Reproduction' or 'Copy' of the Timeless.*—Let us next take up the attitude

which, while it still emphasizes the reality of the eternal, strives, however, to give some significance to process or history in relation to the eternal consciousness. With the strong emphasis that Hindu thought always places on the eternal and timeless character of reality, two of their greatest systems have been forced to give some, though a grudging recognition to the significance of history. Thus the realistic Sankya system, while its ultimate reality is a timeless plurality of self-conscious souls, still admits a secondary principle, Prakriti, the world of process or matter, as the necessary condition of the soul's becoming self-conscious. It is only by reacting upon Prakriti that the soul awakes from its sleep and rises through the various stages of development. When the soul becomes conscious of itself, Prakriti like a timid maiden withdraws, never to appear again. Thus Prakriti becomes a model of modesty and disinterestedness, giving everything, yet claiming nothing, which would be more credit to Prakriti, if its existence did not vanish in the light of knowledge. How nothing at all could furnish the possibility of development and the realization of the ideal of self-consciousness is difficult to understand.

Even Buddhism, in spite of its condemnation of becoming as an illusion arising from ignorance and desire, and while its ultimate goal is the negation of desire and process, a bliss which from the point of view of time existence is indistinguishable from nothing at all, still makes ethical process the path by means of which Nirvana must be attained. The bliss of inactivity must be attained by disinterested activity, the enlightenment that multiplicity and change are illusion can only come through a long series of existences of suffering, in which the Karma or character acquired in previous existences, conditions the form of the new rebirth, until finally as a result of the enlightenment and expiation of this process, the truth of the illusion of all process and existence makes the soul free and at rest.

Plato, in spite of his sharp distinction between the time world and the eternal ideas and his scorn of the former, cannot help recognizing it in various ways. I do not refer to the *Timaeus*, where he speaks of time as the image of the eternal, for here

he has in mind the measure of time, especially the regular movement of the heavenly bodies, which in their very regularity and periodicity are for Plato symbolic of the rest of the eternal. Here Plato has simply abstracted from the essence of time altogether. I have reference to the grudging recognition of the world of process, the Heracleitean flux, which is wrung from Plato in various ways.

Thus Plato recognizes the reality of the world of process by the resistance it offers to the mirroring of the ideal; *ελη* is not mere passivity, it distorts and resists the ideas. This resistance, as pictured for example in the *Phædrus*, gives special significance to the ethical struggle. Only through a long struggle, through repeated curbing, failure and chastisement, does the unruly steed of appetite become amenable to the control of reason, and make possible the rest and rapture of the contemplation of the eternal beauty. Here, then, process and time are at any rate recognized as means to the eternal end.

But the whole process of education, whether outlined pedagogically as in the *Republic* or poetically as in the *Symposium*, involves and presupposes the reality of process. There is a necessary order of educational steps, whether it be described in terms of institutional adjustment, as the use of tools important for the education of all, music and gymnastic for those surviving in the process of selection, and divine dialectic for a chosen few in their maturer years; or the æsthetic ascent of the soul in the *Symposium* from the love of one fair form to the love of all fair forms, from fair forms to fair actions, from these to science and institutions, and from these to the eternal ideas. This order, moreover, corresponds with stages of psychological development. Heracleitean process, contradictory and unreal though it is supposed to be, is at least the path by means of which the soul reaches its insight into Parmenidean being.

To be sure in some moods Plato is inclined to condemn process altogether. Thus in the *Phædo* process itself seems to be an evil, plunges the soul into the darkness of ignorance and the forgetfulness of sleep. The process of recollection itself leaves us at any rate no better off than we were at the outset. History here loses all real significance.

A great deal has been made by students of Plato recently of what seems to them a dynamic or functional view of reality, especially in the *Republic*. Plato does indeed use language there, which has a strong functional flavor. When, in the fourth book of the *Republic*, he tells us that men make the state in accordance with their needs, this indeed sounds dynamic. But to regard the provisional definition given in the fourth book as Plato's definition of the state would be as reasonable as to regard the definition of justice given in the first book as Plato's definition. In the seventh book, where Plato is in a position to give us his philosophic definition, the real state is looked upon as an eternal idea. Our making of states is a poor imitation at best of the heavenly pattern, which of course is unaffected by our efforts. The real statesman is the philosopher, who through dialectic has become conscious of the perfect state, and who through his experience with men in the world of shadows knows how to adapt the ideal state to actual conditions. But even the work of the philosophic statesman is not ultimately productive. He merely imitates what is, as conditions will permit.

A keener sense of the reality of process, and even a conscious recognition of the significance of history, is to be found in Plato's great successor on the philosophic stage. There are for our purposes two rather distinct Aristotles: Aristotle dominated after all by the Platonic ideas, who means to make process significant and fails, and Aristotle, the empiricist, who has given us some potent suggestions toward a system of real dynamism. It is the distinction, which comes out so strongly in his *Nicomachean Ethics*, between Aristotle the intellectualist, who espoused the virtues of contemplation as supreme, and Aristotle the practical man and statesman.

We shall first take a glance at the traditional Aristotle and his traditional categories, the potential and the actual. It is perhaps fair to say that these famous categories have led to more verbiage, more hood winking with truth and logical juggling than any other categories ever invented. They are so thoroughly superficial and so obscurely plausible. The only excuse for paying them any attention is that they still dominate largely our thinking.

No category is more confused and indistinct, when you begin to think about it, than the potential. Aristotle himself is difficult enough to make out. Thus he uses the term $\psi\lambda\eta$, matter, which somehow must be at the basis of process, as truth knows no process, in at least four different senses.

1. As mere privation or negation, mere passivity, the feminine as opposed to the masculine principle.

2. As evil, the source of counter workings, accidents and incompleteness. These two uses Aristotle has in common with Plato. They indicate an essentially static view of reality and give no real recognition to process.

3. As substance or substrate, the basis of individuality and perception.

4. As a lower stage contrasted with a higher. In this matter loses its foreignness in the light of the transformation. The latter two uses are typically Aristotelian.

These positions for our purpose may be reduced to two: First, $\psi\lambda\eta$ as external or foreign to the actual or the entelechy; second, $\psi\lambda\eta$ as a lower stage, as being matter or form according to the point of view.

If matter, in the first place, is something foreign to the actual, another kind of existence opposed to it, then we have an irreconcilable dualism. No $\tau\rho\acute{\iota}\tau\omicron\varsigma \alpha\nu\theta\rho\omega\pi\omicron\varsigma$ could be found, which could relate them, for the relation would somehow have to partake of the existence of both terms; and hence would fall asunder, by its own contradictoriness, *ad infinitum*. Aristotle himself has sufficiently exposed such contradictions in the case of Platonic ideas, Pythagorean numbers and Democritean atoms. This reduces us, therefore, to the second alternative, which seems more truly to represent the common sense of Aristotle.

We must regard matter and form, then, as relative conceptions. This relativity, moreover, is not merely subjective, but objective. It would not help us any merely to translate the old ontological dualism into subjective points of view. Points of view are just as stubborn as are objective facts. Moreover such subjectivism would be foreign to Aristotle.

If matter and form, the potential and the actual, are objective categories, the question arises as to the relation between

them. They must somehow be continuous and involve some identity, if Heracleitus and Parmenides are to be reconciled. Let us see what that means.

The potential and the actual must not be altogether identical, for then it would be superfluous to have two terms for them. Process would vanish, and we should be back in the Being of Parmenides. Nor could they be partly identical and partly different, for then in so far as they are identical the distinction of potential and actual would vanish; in so far again as they are different we should have our old irreconcilable dualism.

It seems impossible, then, for the potential and the actual to coexist in the same universe. We should have to side with the Megarians, as against Aristotle, that only the actual is. The potential is not an ontological fact at any rate. The acorn is an acorn, and the oak is an oak. The acorn is not a miniature oak, it is not an oak at all. When the oak seedling occupies the space of the acorn, the acorn has disappeared. If we want to explain the transformation of the acorn, we must do so in terms of chemical changes actually going on. Science is right in discarding teleological categories for purposes of explanation.

To be sure, as a result of chemical changes, we find that nature repeats certain successive forms; and, because of this uniformity of nature, we are justified in expecting the same result, given the same conditions. But it would be absurd to say that our subjective attitudes of expectancy or our inner purposes constitute the process or explain the successive transformations.

There can be no doubt that for Aristotle the potential and the actual coexisted; the end or *τέλος* is in the beginning; the later stages, somehow, in the eternal world, coexist with the earlier in history. The 'unmoved mover' is both the efficient and the final cause of the universe. Sometimes, as in the *Physics*, he is conceived as giving the world a push from outside, in other places he is conceived as drawing the world to himself by the enjoyment of the simple pleasure of the contemplation of his own complete unity. But he remains, somehow, external to and coexistent with the ongoing of process, and if process is to be explained at all, it would seem that it must be explained

independently of Aristotle's God. The ultimately final cause does not act upon the world, does not influence process in any way, and hence does not really explain process.

Aristotle confuses a psychological attitude or a subjective construction with ontological fact, and hence the contradictoriness of his results. His successors have followed suit. Sometimes they have accepted his results and put on a wise look in pretending to explain process in terms of the implicit and explicit, etc., and have found enough stupid people to accept their pretensions. Sometimes, like Bradley and others, they have traded on the contradictions of Aristotle's confusion of terms and, presupposing the ontological character of both categories, have tried to make all process and history absurd.

Aristotle, himself, with his keen sense for fact did not seem to feel satisfied with these categories. The *entelechy* does not really do anything to process. God, the final and simple truth, does not influence history. The rationale of process must therefore be found within process itself. The soul develops because of its own inner yearning, its own demands for completeness. In his *Ethics*, Aristotle shows again and again that insight can only come through practice. It is, as through actual doing we establish habits of conduct, that we are enabled to see or fail to see according to the nature of our conduct. As good conduct, however, tends to welfare and happiness, we are assured of progress. Activity or adjustment, then, conditions insight or truth.

In his logical treatment of the judgment, again, Aristotle showed that there could be no judgments of the future, as judgments relate to a present constitution of things. The future is now non-being and has its own character to develop, which cannot now in its real futurity be predicted. Had Aristotle developed this tack of his philosophy, there would have been very little for present day philosophy to do. We have at any rate in Aristotle the suggestions toward an absolute dynamism. Such a dynamism, however, involves a new definition of Aristotle's concepts both in the *Physics* and *Metaphysics*.

The philosophical and scientific conceptions of process, both in mediæval and modern times, have been largely reverbera-

tions of the categories of the Platonizing Aristotle without his empirical insight. The *universalia ante rem* of God's mind, which give reality to things or exist *in re*, and are discovered by us *post rem*, show us in the mediæval realists the confusion which we have found in Aristotle.

Nor do we fare any better with the modern idealists with all their pretense to recognize history. The Hegelians simply juggle with Aristotle's categories. For Hegel himself, history is simply a sort of kinetoscope, where the logical categories, Being, Non-being, Becoming, etc., appear to pass in proper logical order. But that is only from our finite point of view, for the Absolute there is no shadow of turning, the universe is one complete system of truth. To be sure Hegel, as Plato and Aristotle, finds that the temporal process offers a resistance to the proper display of the categories, matter seems to contain an element of contingency. But that probably is only for us. It is all transparent to 'the master of the show.'

But not only to the Absolute, if there is an absolute consciousness distinct from ours, but to reason everywhere as it goes through the dialectic process, in the race and the individual, there is a necessity which sweeps us on from one category to another until we have completed the cycle. Sometimes it seems to be by feats of remarkable tumbling on the part of the categories themselves, by holding on to one another's tails, that they again and again land on higher levels within the hierarchy of logical completeness; sometimes, and probably more fairly to Hegel, it is because the logical system is eternally complete from the beginning, because the Absolute exists whole and undivided in all the timeless logical stages, that the absolute reason in us is swept on to the Absolute Idè. The Absolute Idè of the end, however, is in no wise different from the Absolute Idè of the beginning. While phenomenally there seems to be succession, in the real world nothing happens. The absolute experience is always complete.

Since Hegel, his lesser followers have tired us *ad nauseam* with their implicit and explicit. Are the later stages simply the earlier stages over again, or do they really add something new? If they are new and unique attitudes of mind, they evidently cannot be simply resolved into the earlier.

When logic has failed, metaphors have been substituted to confuse the thinker himself and others. Green and others like to speak of finite experience as a 'reproduction' of God's experience. Can ideas be poured from one consciousness into another like so many beads? That may have seemed plausible in the days of 'mental chemistry,' but is hardly plausible now. Such a metaphor, moreover, while it explains nothing denies all significance to history.

Recent thinkers, like Bosanquet, make the time world the logically incomplete and predict its vanishing as we attain the complete point of view. But why this seeming incompleteness? Must not that somehow be taken account of? Perhaps it is the character of the universe to be thus incomplete. Perhaps completeness after all is merely an ideal demand. With Royce, time seems to correspond to the incomplete finite will rather than intellect, but with him, too, reality or the Absolute is complete.

To be sure, science postulates such completeness. Clifford and Mach tell us that, as we come to understand the relations of things, we shall ignore velocity or the time aspect. The mathematical equations of the law of gravitation are to them the type of knowledge. If you once know the position of any particle, you can read off the infinite past and the infinite future. But mathematical equations are not explanations. The seeming time facts cannot be ruled out of court by a mere ideal demand. Besides there may be other ideal demands more fundamental, for example the ethical, for which these time facts are essential. Even Clifford recognizes that the above point of view is an abstract point of view and holds only within a now constitution of things.

At any rate let us stop juggling with points of view. The universe is either really complete, or incomplete, a logical system or activity. The question is which attitude can best meet the demands which the universe makes upon us and we upon it. We shall hold at any rate to the postulate of Hegel, which he sinned against so much, namely, that 'the real appears.' If, therefore, the universe appears to change there must be a basis for it in the real.

In Leibnitz it would seem as though time and history were fundamental in the conception of reality. Each monad develops from within, from the confused stage of being to the self-conscious or purposive stage, the will being always determined by what seems best. But, on closer scrutiny, it turns out that nothing really develops or happens. The later stages are already contained potentially in the earlier. Each monad is absolutely determined by its concept or its nature. Once knowing this concept you can predict every happening within the monad. There is spread out before you the infinite past and future, as well as the perspective of the whole present system of things. To be sure the monad is a created fact and so contingent upon the will of God, but once a fact it is determined by its concept. It is also true that inasmuch as we do not know our own concept, or what has been predetermined, we must find our own answer. But the answer we find is always given with our constitution.

There is no real conception of history, therefore, in Leibnitz's system. What really is, is the final concept. Leave out the *pre* from preëstablished and for creation substitute individual concept, and you have lost nothing out of Leibnitz's world. Every fact of the universe is what it is by virtue of the constitution of things. There is a sufficient reason for every individual shade of fact within the whole. Happening is thus a confused view, both as regards the interrelation of monads and the relation of facts within each monad, and gives way to the static concept of the completed whole. The soul atoms of Leibnitz are in the end as indifferent to history as are the extended, hard, and horrid entities of the materialist.

Sometimes, indeed, in modern philosophy the practical demand for real doing and real achievement make themselves felt. Thus Kant finds it necessary for ethical purposes to postulate immortality, for only in an infinite process can 'the moral law within' conquer the surd of impulse. To be sure this is absurdly inconsistent with the definition of time as a subjective form of perception! But Kant after all is saner than his theory. He is like the son in the parable, who told his father no and went.

Fichte, too, dominated as he is by the ethical motive, seems to imply action or real activity. It is in a process of

real activity that the rational ego strives to make its own the non-ego, the irrational limit of impulse and sensation. The ego, in his *Science of Ethics*, is free not to act, free to commit suicide at any rate. But, in the *New Exposition*, he seems to abandon this view of the universe as essentially unfinished or in the making, for the view in which the universe is one complete, ethical system, in which we are merely view points.

If, in concluding this survey, we turn to the conceptions of modern science as regards activity, whether physical or psychical, we find that modern science on the whole is occasionalistic, if not altogether phenomenalistic. For productive causality and interaction, science has substituted liberative cause and parallelism. As regards physical phenomena, all we can say is: Given certain conditions, we may expect certain results. Scientific knowledge is simply a systematizing of our expectancies in regard to things. Postulating the uniformity of nature, we may suppose that in so far as the conditions repeat themselves, the results will repeat themselves. Assuming certain fundamental entities, atoms for example or chemical substances, their different groupings bring about the different results in the perceptual world. But in the meantime nothing has happened to our conceptual entities, which emerge as serenely indifferent as ever.

What is true, in regard to the relations of so called physical facts, is equally true as regards the relation of psychic to physical facts. One set of phenomena, indeed, seems to be the condition of the taking place of the other, but to regard one set as producing the other is scouted as savage superstition. It does not matter, moreover, whether we take the phenomenalistic or the substantial point of view. If we take the latter, physical substances may be conceived as merely liberating the properties of the individual soul substance or perhaps refracting the eternal light of the absolute consciousness in the world. Such a possibility has been suggested by so good a dynamist as Professor James, in his lecture, *Human Immortality*.

If we take again the phenomena of individual consciousness, activity here means for modern psychologists in general, as it meant for J. S. Mill, only predictability of what is going to

happen next. Real happenings or real productivity on the part of the self is scouted by most modern psychologists.

The above attitude, when it does not become dogmatic, may indeed be taken as a wholesome confession of ignorance and a scientific protest against the ignorant dogmatism of materialism on the one hand and antiquated theological systems on the other. But, after all, it is only a confession of ignorance of the real behavior of things. To say *ignoramus* is certainly justified in view of the state of our conceptual construction. To add: *Ergo ignorabimus*, is simply presumptive dogmatism of another kind. The conceptualizing activity did not reach its end with Herbert Spencer or any one else.

Questions must, however, occur and demand recognition as to the relation between the conditions and the results, the static conceptual entities and the flux of the perceptual world. Platonizing in science must meet the same difficulties as Platonizing in philosophy. In either case, how can static conditions bring about novelty of result or any happening whatever?

This confession of ignorance is not confined to our mechanical concepts only, it is also slowly making itself known as regards more concrete concepts. The Darwinian and Spencerian notion of continuity in evolution is giving way to a greater recognition of discontinuities, which can afford advantage in the struggle for survival. This makes it possible by artificial selection to create new species sometimes in a single generation, and must have had the same effect in natural selection.

In logic we hear a great deal about the inductive leap *par excellence*, though every new inductive generalization must be regarded as a leap. Had Hegel written his logic now he might have substituted a series of leaps for his dialectic continuity. Each stage of process requires its own characteristic categories. Concepts do not contain any 'implicit' springs in themselves to leap into new categories! They are created and modified in obedience to a new reality.

The concepts of freedom and chance, which have been so obnoxious to science in the past, are coming in for scientific and philosophic recognition, within a generation, on the part of minds of the first rank, such as Professor James, Charles S.

Pierce, etc. This shows a tendency to recognize real happening as against a mere semblance of happening. What we need are new conceptual tools to work with.

3. *Time and Real Dynamism.* — It will be noticed that in all the attitudes examined, it is taken for granted that time is serial. It is this serial character of time, which makes Zeno reject time and process as contradictory; and the idealists from Plato down have accepted Zeno's conception and Zeno's result, thus emphasizing the fundamental timelessness of the real. Some philosophers, on the other hand, while accepting Zeno's concept of time as serial, have tried to maintain, in spite of Zeno's paradoxes, that such serial time must be ontological. As against such realists, we side with Kant and the Idealists that the serial aspect of time is subjective, is our construction, our form for spreading out experiences.

But we maintain further that the paradoxes of Zeno are due to confusing between the serial or formal aspect of time and the real aspect, and trying to make the former serve the demands of the latter. As against Zeno and his successors we have tried to show, in the first part of the paper, that the passing or non-being character of time is its real character, and that our serial construction of past, present, and future is secondary and presupposes the ontological non-being character.

If you endeavor, as Zeno did, to make a static timeless series answer the demands of the change character of reality, then you will have youth and old age, the birth and the funeral, coexisting. To speak of serial time as irreversible, as Kant and Fichte do, is simply a tacit denial of the serial character, and a reference to a more fundamental character. A series, in the very nature of things, must permit of starting at any point and passing backward or forward at pleasure, the passing making no difference to the series. This is recognized by Fichte in making the present a mere arbitrary starting point.

If you start with the ontological non-being character, nothing is more natural than that the ego, beside the three spatial dimensions found convenient within the 'specious present,' should project the additional dimensions, in response to its changing content, one to spread out the symbolic representa-

tions of that which is no longer, and the other to adjust itself to contents it may expect, granting the uniformity of nature. The latter itself, we shall see, while a convenient, is an ultimately relative concept.

While this character of time has been implied in human attitudes ever since man began consciously to react upon reality, yet it has never found scientific formulation in the history of philosophy. That the broken china cannot be mended, that what is done cannot be undone, are common sense maxims expressing the necessity for human beings of adjusting themselves to a world of real happenings.

These common sense maxims were emphasized and perhaps first brought to conscious reflection by Heracleitus. "We cannot bathe in the same stream twice," "Water comes from earth and soul from water, but water is death to soul and earth to water," are ways in which Heracleitus expresses his belief in the irreversibility of the real processes of things. Heracleitus, however, was not in a position to distinguish between real process and our subjective meanings which strive to express this process. The distinction between the subjective and the objective had not yet been made, and for Heracleitus the process and the *ὁδός*, the traveler and the path, the change and the 'measure,' seem to have equal reality. If in his ontological speculations he emphasizes the process or flux, in ethics he emphasizes the supremacy of the *λόγος* or 'the common' and thus becomes the father of Stoicism. Moreover, for Heracleitus process itself seems cyclical.

In modern realists, who generally speak of time as 'the sense of duration' with Descartes and Locke; or, more objectively, as 'the duration of process' with Shadworth Hodgson, we have the real time character confused with its opposite character, that of habit or duration. Modern realists, moreover, quite as much as the idealists, deal in static concepts, whether it be the substances of science or some sort of unknowable, which exists out there independent of consciousness. Realism so far has generally been a cruder idealism, dealing in abstract conceptual entities, but not suspecting that they were conceptual. With realism (until recently at least) as with

idealism, a static conceptual construction is made to do service for real process. Instead of hypostatizing his ideal demand for truth and unity, the realist hypostatizes his atoms and molecules, his material and immaterial substances, and other working hypotheses.

A real dynamism, on the other hand, must make truth relative to process, not process to truth. Truth is the way a cumulative process looks upon itself at a certain stage of its development and to meet certain demands. If process is real, then reality is infinite, and truth never can exhaust reality. In other words, it will take an infinite number of truth universes to register or symbolize a universe of process.

CHAPTER IV.

TRUTH AND PROCESS.

It would be difficult to understand how the obvious facts of process, enforced all the time by the world of both objective perception and inner appreciation, and requiring perpetual readjustments in our world of practical relations, could have been so stubbornly ignored in philosophy, if it were not for a deep-seated demand in the human mind for permanency and unity. Only in a world with some permanency of character or constitution is truth possible. Only in a world which admits of definite structure, where past process can somehow crystallize into present habits, could the conditions of higher consciousness be realized. It is because, somehow, we can store up the past in the present that our own life comes to have meaning. If we take the social point of view, it is only because there is a large degree of uniformity in the world beyond our private consciousness, because processes for practical purposes do repeat themselves, that we can have such a measure of expectancy as makes adjustment possible. Process itself is inconceivable except for some grist to grind, a structural aspect which can be continually retransformed. Negation *in vacuo* is at best a logical abstraction and nothing more.

In a world of mere static structure, on the other hand, there could be no concepts and therefore no truth. In a world without variation of attention, existence and consciousness must be inseparably agglutinated. It is, because in the fleeting changes of our experience some more permanent contents are abstracted and become representative of other more concrete and therefore more variable contents, that we come to have concepts and judgments. Those mental structures, in other words, that are constituted by the common characteristics of experience are sharable and permanent, as the others are not, and so can serve as symbols for the rest. Our concepts are tools, in the service

of the will, by means of which the self learns to anticipate a varying environment, the self becoming conscious as it learns better to define its needs in terms of the objects of the environment and at the same time learns to define the objects, that limit it, in terms of its needs.

There seems, therefore, to be an antinomy involved in reality itself. We must, on the one hand, acknowledge the structure aspect of the world, for without that we should have abstract non-being only, and consciousness and object alike would vanish. On the other hand, we must acknowledge the time aspect, the non-being factor, for without that the variations in our meanings and practical attitudes would be unintelligible, whether looked at from the subjective or objective point of view. Moreover, it is only as structure becomes function, as it does something, that it can have meaning at all. Structure in the end must be regarded as a conceptual abstraction to account for the relative uniformity of process. In the world as we know it and to which we must adjust ourselves, the structural aspect and the non-being aspect must both be taken account of in order for us to get a consistent conceptual description. Truth presupposes a changing and pluralistic world. I will not here discuss the fact that social interaction seems to be necessary for the arising of thought, though that would probably be admitted. What I have tried to show is that in any solid block world there could be nothing but pure immediacy. The conditions for truth are wanting.

It is further clear that the only reality, which we can take account of and assume practical attitudes toward, must be a reality of experience. Though this has been a subject for profound dialectic, it is a mere truism. It is simply saying that what exists for us does exist for us, and conversely that what has no existence for us has no existence for us. The only data any one ever had or ever will have are his own states of consciousness, the only law or order which we can discover in the universe must be the result of our projecting our own ideal demands of consistency and simplicity, and our concepts sorted on the basis of such postulates. If experience is all we can know, then it is at best a useless hypothesis to postulate something outside,

external and foreign to experience. While anthropomorphism is poor philosophy, as I shall show later, yet it is right in so far that there must be some continuity between the knowing thought and the object it strives to know.

The trouble with idealistic philosophy in the past is that it has dealt with too narrow a definition of experience. It is built upon the presupposition that experience is fundamentally reflective. Only self-conscious experience counts. The truism, no object without a subject and vice versa, does not apply at all to that vast mass of experience where reflection has not arisen and where, therefore, the subject-object relation does not exist. Even in human experience it is a comparatively small part that is reflective, and we do not have to go very far down into the animal scale, before 'awareness of' takes the place of any 'knowledge about.'

What sort of reality do we have in dreamless sleep for example? Is our only reality to be the content of some reflective consciousness? But if our own reality in such a condition equals zero, why is it that our being asleep has important consequences for our further thought activity? We went to sleep tired, unable to think out the simplest problem, but we wake up refreshed and in a new mood altogether, and perhaps the problems have solved themselves. Something must have been doing, while subject and object had vanished out of existence, for such important consequences to be produced to thinking itself. There is here a continuity of experience which cannot be stated in reflective or teleological terms as regards its own being.

In the process of communication with other individuals we have paid attention in the past only to the termini of the telephone or adjustment. We have failed to take account of the intermediary processes, which make the two consciousnesses continuous with each other. It is only in highly special cases where the hypothesis of thought transference and a common sub-conscious or sub-attentive soul life has been invoked. In order for any communication whatsoever to be possible, however, there must be some sort of continuity between the minds communicating. What we call the world of physical processes intervening must be merely a continuum of marginal or sub-

conscious processes, which make the world akin and make it possible for our private consciousnesses to hold hands and to some extent move together.

While we recognize, therefore, the importance of the postulate of continuity for knowledge, while we seem to be driven by the nature of our thought to the assumption that only like can act upon like, and that, therefore, there must be some community of stuff in the universe, yet we are not therefore warranted in assuming identity of conscious content, as absolute idealism does. The novelty, which results from communication for the individual consciousness, and the leaps in the evolution of consciousness, both in the race and the individual, especially the inductive or reflective leap, would not be accounted for by the assumption of an identical, unvarying consciousness. Even if we assumed such a consciousness, we should have to go to work and explain all the variations or processes of evolution independently of it. It would in the end be as useless as Plato finds Anaxogoras' *νοῦς* and as Professor James finds the traditional soul.

For our purposes, at any rate, a large part of the universe may be treated as material. It can be used as means to an end, without any need of respecting any end there. While even the simplest structures of reality must be continuous in some way with the history out of which our conscious life has emerged, yet whatever experience stuff may be back of their dead semblance, it is so simple and stereotyped that to us, except in some occasional poetic moods, it does not mean psychic reality at all. To speak of these simple inorganic and lower organic structures as potentially self-conscious would be as useless as it would be false. It is their present being with which we are concerned. As, moreover, they have a history as old as the higher forms, they cannot be regarded as in a process of development toward higher forms. They are adapted to their own kind of environment.

Continuity, as far as we are concerned with it, only means the possibility of arranging our facts in a series of graduated difference. The only case where we have immediate consciousness of continuity is in our own activity as in the drawing of

the line, in every other case continuity is a postulate. In the case of the historic strata or forms, we believe there has been such a flow; and this belief seems the simplest way of accounting for the facts. So far, however, from the unity of thought being the only kind of continuity it is evident that ideal continuity presupposes real continuity or continuity of process. The latter type of continuity is postulated in every act of communication, through our own non-reflective moments including sleep, and throughout history below the reflective level.

The definition of reality, therefore, in teleological terms, which seems to be prevalent to-day in all schools, which is the method both of absolute idealism and empirical idealism, has obvious limitations on the ontological side. For logic and epistemology it is true that reality has meaning to us only in so far as we define it in terms of our purposes. Knowledge, as Spencer and James have shown, is a tool constructed in the service of our demands or needs, a sorting process that makes the universe amenable and valuable to us. But to maintain, because we are forced to translate the universe into terms of our interests or purposes, that the universe, therefore, is adequately accounted for when expressed in terms of the fulfilment of purpose or teleological fitness is anthropomorphism of the grossest kind.

The humanistic standpoint is indeed preferable to that of the absolute idealist, who is trying to foist upon us his own ideal of knowledge as the absolute. If there is in the universe such a supra-human consciousness, we should at any rate do the same violence to it that we are doing to infra-human consciousness in translating it into terms of our human purposes. But the position of empirical idealism, that the universe is significant for us only as we define it in terms of our purposes or needs, is, after all, a mere truism. It only amounts to saying that the universe is significant for us, when it is significant for us. It is a definition of the nature of our knowing, in terms of itself, but not an account of being.

While empirical idealism is more modest than absolute idealism, and the truer account of such knowing as is possible for us, it, in the end, ignores process as effectually as the latter.

Only fulfilment or attainment can be real. Ignorance, failure, absence of purposive consciousness, are brushed aside as unreal. And yet how much of human life is reflective? Is the reality of the other moments, the non-reflective states, such as instinctive and emotional states, simply their existence in a reflective state, which defines them in terms of itself? If so, the presence of an eternal, absolute consciousness would seem to be called for. This, however, is simply the denial of the reality of all non-reflective consciousness *as such*. While such consciousness may be purposive to a reflective moment, which treats it as means to its own end, it was not purposive to itself. And yet it was something in order to fulfill purpose. To call it potentially or implicitly purposive is simply another way of denying it reality in its own right and treating it as a *mere* means.

While knowing, then, is an important aspect of reality, we must not try to resolve all of experience into the attitude of knowing. Self-consciousness at most is a small part of life. To the sleeper, whether human or sleeping nature, there is no significance. Significance appears only, when, after passing through intermediary stages, he has become awake. But, unless the sleeper had reality, his waking would have no significance. His reality as a sleeper, therefore, is continuous with reality as being awake and having significance, but is a different reality, whether regarded from the social or individual side. Because for practical purposes we can regard some forms of reality as means to an end, we must not deny them reality, because then they would not even be means or limitations.

Schopenhauer's translation of the lower stages of reality into terms of will is only another form of modern animism. He attempts to strip his own experience of everything but striving or yearning, and then ejects this abstraction of his own experience as the identical essence of the universe. This is poetic at least, if it is not philosophical. There is no such thing, however, as identity of content in the evolutionary processes of the universe. You cannot get a middle term between the simpler and complexer forms of consciousness. There is such continuity, indeed, in the series, as makes some anticipation possible. But continuity does not mean identity. If it did, proc-

ess would disappear. We cannot properly speak of the lower stages as experience even, in the sense we usually attach to the term. All we can say is that they are continuous with what we call experience, that, in the greater complexity of the succeeding changes, they issued into human experience. But the simpler existences were then no longer.

I want to register a protest, therefore, on the one hand, against the presumption of absolutism to a supra-human knowledge. We do not in any sense compare our fragmentary human knowledge with an absolute knowledge or meaning. If so, we should be fools indeed for not throwing away the 'worser' half, our finite knowledge with its illusions and imperfections, and for not keeping the better half, the complete and absolute. We do, indeed, criticize our present concepts, but not in the light of adequate concepts, which we do not possess, but in the light of certain demands, which we are so constituted as to make — demands for consistency and unity. Contradiction is to us, while thinking, a standing challenge to further thinking and investigation. But this challenge obviously does not mean a knowledge of the unitary whole which we are seeking and may never attain. The only absolute thing about the attitude of knowledge, when we have it, is the demand for knowledge, the faith that the seeming chaos can be reduced to order or meaning. Somehow, too, we may believe that the universe is responsible for this demand. If we, clay of the universal clay, awaken at moments to make such demands, these demands cannot be entirely foreign to the stuff that the universe is made of, though the concrete meaning of these demands must vary with every stage of experience. All we can say is that consciousness, at a certain stage of its development, does make certain demands, does take the reflective leap. This surely could not be accounted for by a consciousness always reflective. The satisfaction or discontent of one moment, so far from pointing to familiarity with the Absolute or comparison with an absolute standard, may prove equally relative as measured in terms of subsequent moments. Our errors of previous moments may prove truth and our truths error. All we can say is that the click of satisfaction and the pain of restlessness feel absolute to

the moment that has them. They may prove prophetic of future moments or they may not. We must take the risk.

But I want to register a protest, on the other hand, against the anthropomorphic subjectivism of empirical idealism. As against this tendency, I want to emphasize Butler's important contribution to modern thought, that our impulses are essentially centrifugal. They aim at objects, not merely at meaning or definition of themselves, though, in working themselves out, they sometimes come to have meaning. They aim at objects that shall satisfy, to be sure, but at objects. Self-consciousness is a secondary consideration, developed to meet unusual adjustments and evanescent even with the highest consciousness. There can be no realization of will, except with reference to objects beyond the will. If the object is identical with the will all the while, the process becomes a farce and an illusion. If you try to account for the process as a coming to consciousness of the will of its own meaning, you have to explain at least the illusion of its discontent.

The will requires, therefore, individuals beyond itself to realize itself. The reply, in Wagner's drama, of Brunhilda to Sigfried, when he is in love: *Liebe dich*, seems rightly absurd to him. What a subjective mire the will would wallow in, if it only really loved itself. Our conceptual attitudes are indeed conveniences for us in manipulating our world; it is advantageous sometimes to treat the universe as means to an end, the mere objectification of our desires. Any conscious animal, however, would have the privilege of making a universe in its own likeness on such a principle.

But while concepts are convenient tools, they remain to the end tools, in dealing with the non-conceptual world. Though we conceive the clam in terms of satisfying hunger, as capable of chemical analysis, good for dissection, etc., we have to the end simply given our subjective attitudes. There remains the clam, without which our various desires would simply return upon themselves as empty as before. The clam must have reality, it must be some kind of content, otherwise our attitudes toward it are all unreal. But the clam itself has no meaning. Its inner constitution is at best a very sleepy affair. Our knowl-

edge of the clam, then, simply systematizes our attitudes toward the clam. But all of them together, yes unified, are in a different dimension from the consciousness of the real clam. Hence it is that the unity of our attitudes, however complete, can never create the existence of the clam nor can our denial annihilate it, if it is existent. The empirical idealist, then, who tries to translate the universe into subjective, human significance, simply moves within a circle. He too has mistaken the continuity of consciousness with its world for identity, and to vindicate his position must presuppose an identical, absolute consciousness.

We have no right then, I hold, to translate into terms of concepts states of consciousness which are not conceptual, except for merely practical ends. No amount of conceptual definition can give us a real equivalent for a sensational consciousness. It is simply the substituting of another kind of reality, exclusive of the former. Sensation, reflected upon, is not sensation.

The only instances where our conceptualizing activity deals with the essence of objective reality, or gives us an equivalent in kind for objective reality, is when the object itself is a conceptual state or the record of such a state. Thus, when we deal with Hamlet or a system of scientific classification, the object we try to grasp is itself a meaning. We are at least not doing violence to the object, in such a case, by making that conceptual, which is not. It belongs to the same grade of reality. The difficulty in such a case is to get the *same* meaning that Shakespeare had, which of course would only be possible if we could reproduce the same conditions, *i. e.*, if we could be identical with Shakespeare at the time he conceived Hamlet. The conceptual object, too, as some one's meaning can be grasped by another individual only as *his* meaning, and the so-called sameness or universality of meaning is again only a matter of social convenience.

Nor would an absolute consciousness for whom the universe is one moment of meaning, is included in one conceptual definition, be any better off. Such a consciousness, if inclusive, in knowing the finite and individual facts would have to transform them into terms of itself and so would destroy that which

they are. If, on the other hand, a total consciousness is conceived, which has present within its unity non-reflective contents, a fringe as well as a thought focus, then to it, too, the universe would be dark and unintelligible in part. Inasmuch, however, as a supra-human consciousness can only be conceived by us in terms of our own experience, if we give it any content at all, it becomes at most a demand for unity and wholeness on the part of our consciousness.

That there is a plurality of meanings in the world, as well as a plurality of non-reflective objects, is constantly brought to our attention. While we mean to mean the other meanings and the other objects, we discover through further experience, or in later meanings, that we failed to understand the other meanings, and therefore failed to adjust ourselves properly. If there were only my own timeless meaning, I could not fail to mean what I mean. But even when there was a mutual understanding of meanings, even when we reached an agreement for working purposes, I may discover in the successive stages of my own reflective life, while my meaning of the other meanings or non-reflective objects remains, that what I meant has disappeared or is no longer what I mean. While the meanings seemed to tally for the time being, the successive moments of the meanings fail to tally. Therefore, the individualities of the two meanings must be different. The meaning of one cannot be exhausted in terms of the other. The differentiation of individuals is thus an *a posteriori* process, and the validity of our postulates and categories with reference to our larger world is not the result of any *a priori* fitness, but is the result of a long process of testing and survival with reference to our needs. Our needs, moreover, are not absolute quantities, but vary with the different stages of development.

The conceptualizing or knowing attitude is final, only when it deals with itself. We can exhaust the reality of the object in the concept only when thought makes its own object, when the meaning and the object, therefore, are identical. Shakespeare knows what Shakespeare's Hamlet means at the time that he conceives Hamlet. His consciousness of his own meaning is final, insofar as it is then and there his meaning. Later he may

have a different meaning, the same lines may mean something new to him, he may even forget his original meaning. But a new meaning is not something more added to an old meaning; it is a different meaning continuous with the old, but not quantitatively divisible any more than the old meaning. Only the state of consciousness, therefore, which has the meaning, is a final judge of the meaning. And the reality of the meaning is what it means to that state of consciousness and nothing else. That meaning may lead to consequences for further thinking, which were not foreseen at the time, but such consequences are not implied or meant in any sense until they are discovered. The meaning has changed, because the self has changed. Only a new self, a new reality can have a new meaning. Meanings do not enlarge themselves, do not ascend by pulling their own boot straps; they grow, they come to have a larger reference, only because the self becomes a new self, adjusted to a larger world. To have a meaning and to know what one means are only two ways of saying the same thing.

While empirical idealism does not furnish a satisfactory metaphysics, it does furnish a good account of knowledge. Our knowledge is conditioned by our selective interest, as Professor James has so brilliantly shown. Our concepts are tools by means of which we become able to manipulate things. Truth, as far as we are concerned, must be tested with reference to the consequences of things to *us*. The relation of things to our needs or demands is fundamental, as far as we are concerned. What matters it to us, if we conceptualize that which is not conceptual, if we systematize and order individuals according to the value they have for us, irrespective of their own order or lack of it, if so we can accomplish our purposes, become more comfortable in the world in which we find ourselves? For us the universe is a universe to fulfill certain demands, practical and theoretical, and we naturally make ourselves at home accordingly and order the universe to do our bidding. If the taking account of things as they appear to us helps us to get what we want, our knowledge is naturally deemed satisfactory. If we have knowledge at all, it must be anthropomorphic, it must be our interpretation in terms of our own

experience. What care we that it does violence perhaps to other forms of experience, if thus we are enabled to live?

Knowledge, then, is an instrument in the service of the will to enable us to anticipate the environment in a way that will prove serviceable to us. Not what reality is, but what reality does to us, is the important question for knowledge. The other terminus to the relation may be below the conceptual level, may be for all we know unconscious altogether, but that it does things to us, that it can be utilized by us, or at any rate that we take pleasure in order as opposed to chaos, is a sufficient reason for arranging the facts, irrespective of what they may be, in a scheme to suit our needs.

What nature is for us, then, is determined by the tendencies or interests with which we confront the world, and may have very little to do with what nature is in itself. Order and meaning in other words, are categories of reflective consciousness, irrelevant where there is no reflective consciousness, but convenient for us in adjusting ourselves to our world. They are order and meaning to us, but need not be so to the things ordered; and, when they are order and meaning to them, they need not be the same meaning.

Thinking itself, therefore, and our categories of thinking have survived, because they have proved serviceable to such beings as we are. It has proved convenient for us to translate the universe into the terminology of human experience, however different from the human it may be in parts. While the facts may know no place in a series, it has proved convenient for us to arrange them in a series. While the individuals themselves have no tag giving them a number, it is convenient for the census taker to tag them as first, second, third, etc. While the successive changes in things may be nothing to each other, yet for our reflective consciousness it is convenient to regard them as causally related, as instances of one law, or as evidence for our hypothesis.

I have tried to show in this chapter that all reality cannot be translated into the reflective type of consciousness without violating and destroying its own integrity. There are various grades or stages of experience, which reflection itself must take

account of, and only a small part of experience, at any one time, can be regarded as reflective. This is true of human consciousness and must be true to a vastly greater extent of infra-human consciousness.

The passing from one grade of experience to another, the passing, for example, from the non-reflective to the reflective type, must be regarded as a leap, a creative act, or must be accepted by us as a fact or gift. The same, however, is true in passing from one non-reflective type to another, as from sensational experience to that where memory and efficient guidance are involved. The same is likewise true in passing from one type of reflective consciousness to another. Such passing we speak of as a new insight, a discovery, a stroke of genius, a work of creative imagination, all indicating that we have to deal here with a gift. Each conscious unity, we find, is a closed circle to itself and cannot predict or compound a new unity out of itself. When the new unity comes, it supplants the old and the old is no more. The old is only a fact for the new. The new meaning, however, while unpredictable *a priori*, looked at *a posteriori* seems continuous with the past, fits in. It fits in because the past has been transformed and appropriated into the present meaning. It has no reality except as it is interpreted by a present subject. As past it has been destroyed.

If this is a true conception of reality, knowledge will fall into two main divisions. Reflective consciousness, insofar as it translates non-reflective consciousness into terms of itself for its own convenience, for the sake of realizing practical ends or getting the æsthetic satisfaction of greater unity of facts, does not give us an equivalent in kind for the reality with which it deals. It defines that in terms of its own ends, which in its own reality has no end or meaning. It simply misses the reality of those conscious states, which can only be had, when reflection does not exist. Non-reflective reality does indeed report itself to reflective consciousness as things, as unities of properties or sense qualities, having a certain relation to our ends. But this unity and these properities have existence only for us as taking account of them. They are, for the time being, a real relation to such a consciousness as ours. To themselves,

however, the non-reflective things have neither unity nor properties. They are their own sleepy selves. To call them 'possible experience' is simply another way of translating them into terms of our own reflective attitudes. But to be possible relations to us, they must be more than the mere subjective attitude of possible. They must be, somehow, experience in their own right. Use what sort of terminology we may, therefore, knowledge on this level of reality gives us only symbolic equivalents or correspondence and may be called phenomenal knowledge.

The other kind of knowledge deals with a reality of its own kind. It is a reflective state interpreting a reflective state, either immediately communicated or recorded. Here knowledge gives a real equivalent. Even here, however, knowledge can only be exhaustive, when it creates its own object, when the meaning means itself. But, even when the relation is not that of identity of meaning and object, there can at least be approximation. The other meaning is necessarily transformed for the time being into terms of the subjective meaning. This transformation, however, must be tested by consequences to the individual experience. Can it predict on the basis of this transformation, adjust its conduct with reference to its meaning and become successful? If so, well and good; our meaning is then practically equivalent, even though not identical. If not, our meaning must be revised on the basis of our failure and the experiment tried again. The common characters and uniformities of experience at least permit of such practical and social agreement or approximation.

While in the latter case, therefore, it would only be possible to have absolute sameness of meaning, if we had one unchanging meaning, conscious of itself only, and while meanings do violence to each other in transforming each other into terms of themselves, we have here at any rate a knowledge of meaning by meaning, and so real knowledge, as contrasted with phenomenal knowledge.

CHAPTER V.

THE PROBLEMATIC.

A. *The Ejection of the Time Series into a New Dimension.*

There are two things necessary in order to understand the significance for us of the past. The past has a non-being aspect, without which it could not mean past at all. The content of the past world exists no longer as such, it exists only as it has been taken up and transmuted in the ongoing movement of experience. The Greeks are no longer besieging Troy, Cæsar is no longer crossing the Rubicon, though those experiences are continuous in history with events and civilizations now real. The question arises, however, if the past world is a world of absolute non-being in its own right, why should we have even the ideal construction of such a world? How can we mean or refer to such a world at all?

The reason that we can construct the past at all is that it involves, beside this attitude of non-being, characteristics or layers within the present that give us a formal or symbolic basis for our past construction. The past is not a mere fiction. It is not for us to make chronology as we please. While the past has no facts of its own, it has a factual basis within the present, which we cannot ignore. Perhaps I can make this clearer by an analogy. If we examine the geological strata, we find the basis within them of a certain series. There are, however, no past layers. All the strata are present strata; all the characteristics are now characteristics. Should the mountain become conscious of itself, however, it could construct a series of conditions, no longer existing, to account for its present character. A better illustration would be a tree. A tree has various layers or rings that enable us to tell something about the history of it. Suppose the tree should become self-conscious, it could construct a series of conditions to account for its present state; and, if it did construct such a series at all, it would

have to construct it in a certain way, owing to its present character. Yet there are no past layers or rings. There is only the present tree as an organic unity, suffused with present sap.

So our reflective moment discovers within itself certain characteristics, certain symbols, survivals in the way of memory, as a survival within the individual organism, or records, which are the survivals within larger social processes, which make it possible to construct an order or series of attitudes which we call history. The feeling of duration itself is a present feeling, however much it may help us in giving significance to the ideal construction of a past series. If we choose to construct a series moreover, the present character of reality makes necessary a certain kind of order, which has a real or factual basis within the present. Each successive moment in the series is such as to supplant, to occupy the space of, and exclude the reality of each preceding moment.

Moreover such a construction is necessary in order to make the present reflective moment intelligible at all. If the birth and the funeral and all the intervening stages were thrown together in one promiscuous mass, experience would be a hopeless chaos. The individual attitudes or meanings, with which history deals, are exclusive of each other, each claims the whole universe for its own, fills the whole of space with its three dimensions. The point of view of the Homeric world, with its gods and heroes; the point of view of the age of Pericles with its art and its philosophy; the world of Cæsar with its conquests and its political ideals, each fills the universe with its presence and does not recognize the reality of the other. In such a Babel of tongues, a timeless view of the world would simply have to commit suicide by abandoning the law of contradiction altogether.

The confusion, however, can be resolved, if we regard experience as making itself anew, as an essentially creative universe, which to some extent at least accumulates past experience into present structure, and transforms present structure into new experience. Each moment of experience brings its space with it, spreads its content out into its spatial and other ideal series. There is no inconsistency any longer in each

point of view claiming the whole universe. Each individual meaning claims *its* universe. When the old meaning and its universe only survive as taken account of by a new point of view in a new universe, the old point of view and the old universe still are seen to fit each other, and no attempt is made to rob the old meaning of its universe.

Thus the present real self, 'the heir of all the ages,' finds it convenient to look upon itself as one out of a series of universes, which have been retransmuted and superseded, in order to understand its own constitution and define its own expectancies. This is true not only in regard to the spreading out of the past will attitudes into history proper. The self also finds it convenient to spread out experience below the reflective level into an evolutionary series in order better to understand the present forms of being and their characteristics; and thus we have theories of biological and geological evolution and nebular hypotheses. Here we simply translate that which knows no meaning or order, which knows no history, into meaning and history for our own convenience, on the basis of certain structural characteristics, as they exist for us.

B. *Knowledge of the Present and the Past Contrasted.*

The present is the field of scientific observation and practical attitudes. Science deals with a now constitution of reality, on the basis of which we can link our facts and anticipate the behavior of things. To obtain such uniformities, science necessarily abstracts from the individual aspect of things and decomposes reality into artificial attitudes, convenient but only partially real. Ethics on the other hand aims to deal with reality as real and individual. It deals with the adjustment of individuals to each other in social life, in which alone they can realize their needs.

There is a peculiarity about the real relationships of the present context of experience, which the symbolic past lacks, that of living response or reciprocity. This has been strikingly pointed out by Plato in the *Phædrus*, where he discusses the advantages of living communication over written records. "Writing," Socrates is made to say, "is unfortunately like painting;

for the creations of the painter have the attitude of life, and yet, if you ask them a question, they preserve a solemn silence. And the same may be said of speeches. You would imagine that they had intelligence, but if you want to know anything and put a question to one of them, the speaker always gives one unvarying answer. And when they have once been written down, they are tossed about anywhere among those who do and among those who do not understand them. And they have no reticences or proprieties toward different classes of persons; and, if they are unjustly assailed or abused, their parent is needed to protect his offspring, for they cannot protect themselves."

The dialectic of the past, in other words, is a one-sided affair. The living speaker himself develops his meaning to his own satisfaction, and that is all that can be asked. Future moments may find the present meaning partial and unsatisfactory, but the symbolic past itself makes no response, says neither yes nor no, offers neither resistance nor encouragement. It is plastic in the hands of the present moment, means to a present end merely, and yet does not complain, does not stand up for its own integrity.

Not so with the individual moments, which really touch or run into each other through their subattentive margins, in the present continuum of experience. Here you have a two sided dialectic, a yes and no relation. Misconstrue the other consciousness and you fail of agreement, fail to realize your purposes. The other reflective consciousness has a meaning and insists that he means what he means, refuses to be the mere instrument to your end. If you would share his life and realize your own larger life, you must revise your meaning of his meaning so as to approximate more closely to the latter. The more comprehensive and sympathetic your meaning, the greater your opportunities for life. Would you construe him simply in your own way, treat him as a mere thing, then you run up against it, you are slapped in the face, sometimes literally; whether you are successful or unsuccessful in this external dogmatism, you forfeit your chances for a larger life, you fail in the struggle. The only way you can succeed is by an

acknowledgment of the demands which the other consciousness makes upon you.

The infra-reflective nature processes correspond for us to the past, insofar that for us they are merely symbolic constructions for individual convenience. No acknowledgment of external meaning is here necessary. To use these processes, therefore, as mere means calls for no protest, and the test of truth on this level is simply the success of such manipulation.

In the relationship of self-conscious individuals within the present social continuum, on the other hand, conscious agreements become necessary. Each individual to realize his demands must learn to recognize the demands which are made upon him by other individuals. Only as there is a mutual recognition of such demands, do social institutions become possible. What beings we are forced to acknowledge as individuals, and the character of these individuals for us, depend upon the demands which we must adjust ourselves to, or recognize in order to realize our own purposes; and the adequacy, on the other hand, of the realization of our purposes will depend upon the adequacy of our recognition of these demands. The closer the approximation of our meaning to the living purposes of other beings, the better we shall succeed in anticipating their behavior and adjusting ourselves.

That there are different individuals, however, can never be proved *a priori*. *A priori* the ego never could get away from itself, would simply have to create its own non-ego outright, and this would be no non-ego at all. A non-ego, which should simply exist as an act of our positing, would indeed be beautifully transparent and controllable, but it would be absolutely barren too, as far as satisfying any needs. It is only *a posteriori*, through our failures of adjustment, that we have come to recognize other individuals at all. And it is only through the *a posteriori* process of ideal construction and trial that we have learned to meet the non-ego in a more adequate way.

At best, however, our knowledge of other individual consciousnesses is a matter of approximation. We cannot be sure of getting the real significance of a meaning beyond our own. Absolute knowledge of such a meaning, as we have seen,

would be identity and so would destroy the meaning as individual. Communication and conceptual definition are concerned with whether we aim at the same objects in each other's experience, not with identity of meaning as regards such objects. Functional identity is all that is necessary for practical relations. The important thing is not whether our meanings are the same, but whether they terminate in similar behavior. If so our meanings may be taken as equivalent.

Sameness of meaning, at any one time, would mean absolute sameness of conditions or mere identity. If there are individual meanings at all, this will be impossible. And we must behave at any rate, as if there were different individuals. The greater the sameness of conditions, however, the greater the sameness of meaning. Twins, it has been shown, manifest a great deal of likeness as regards tastes and preferences. But however closely alike the objective conditions may be, there is a difference in subjective conditions, difference in emphasis, difference in initiative and choices. It is not possible, therefore, to infer with any degree of accuracy from one individual to another.

The greater the disparity in conditions and meaning, the more difficult becomes the problem of agreement or common understanding even in the crudest ways. How difficult it is for us to interpret the child consciousness and sympathize with its aims. We treat them just like little big people. How little sympathy we show with savage races, and how little, if any, significance we attribute to their lives. Still more problematic becomes our knowledge in regard to animal consciousness. We are either apt to deny to the higher animals any significant life or else to attribute to them our own consciousness. In the lowest organisms and in the inorganic realm, consciousness becomes a mere demand for continuity, as far as we are concerned.

Even in the living present, then, and where the conditions are most favorable, our knowledge is decidedly problematic. The value of our knowledge, even on the highest level of development, must be estimated from the point of view of convenience for action and enjoyment, rather than with reference to exhaustiveness.

In the meantime, since reality is individual, and because the individual is dynamic, there is an element of non-being in our knowledge. Our ideal construction gives a content of its own to reality beyond. And as the reality beyond is ever changing, the prospect of exhausting the surd and reducing the universe to the dead level of sameness is a dream at most of those philosophers, in whom the passion for sameness overmasters every other passion. Only in a world of abstract averages could such a permanent instinctive adjustment, as Spencer dreams of, be possible, not surely in a world of unstable individual equilibriums, with the possibility always of new insight as well as the possibility of going wrong. Each creative act, whether new purpose or sin, changes the total complexion of the universe and involves a fresh readjustment. In a world like ours, therefore, there will always be coexistent many experience moments with their different perspectives of history and nature, each with its space world and its scale of values. Sameness for us is, at best, a category of conceptual abstraction, to be used insofar as it may be convenient. Better live in a problematic and contingent world, however, with something to do and something to attain, than suffer from the *langeweile* and dull monotony of a world where nothing happens.

The difficulty with the past, as we have seen, is that it makes no living response or resistance. We are dealing here with attitudes no longer real. We may find analogous attitudes coexisting with us, as in the case of savages, but they too are evolved attitudes under differing conditions. As to the past attitudes themselves, we must rely on records, but the records are merely symbolic of past points of view. These have been taken up, and, through intermediate stages of interpretation usually, transmuted into the reflective consciousness of the present. The thought universe, within which they lived, is at most only a partial world to us, a stage in the evolution of our own experience, while to them it was the whole world. The mythological world for example, which was reality itself to our ancestors, is a mere shadow world to us, at best preparatory for better things. It was a belief world to them, it is mere fancy to us. We do not get the past attitudes or meanings *as such*, we get them only

as transmuted and appropriated into the historic movements that have succeeded them. That is their significance for us. How plastic history is, is evident from the difference in emphasis and interpretation from age to age. Each age uses history for its own ends, reconstructs the past for the sake of its own purposes, and in obedience to its own needs. The more comprehensive the point of view grows, the more hopeless is any realization of the real meaning of the primitive attitudes. Sometimes there has been an attempt to regard the past as resolvable into mere degrees of complexity with reference to the present. This as an artificial device may be justifiable. It is convenient sometimes to regard the savage and the baby consciousness as our consciousness simplified, to regard their reactions as realizing purposes of will. Such meaning as we get out of the universe must naturally, as shown before, involve such a translation into terms of ourselves.

History must be regarded, then, as our ideal construction on the basis of present symbols, which represent a factual order, now real only for us. Its justification is a practical one. In appropriating the institutional or accumulated life, we come to consciousness of ourselves, we come to understand *our* world better and anticipate better its behavior, though the music and discord of the past have been merged into the movement of the present. We can act more intelligently, in other words, for understanding those present characteristics, which we can only make consistent by arranging them in a serial order, as exclusive of each other, in a new dimension. The past dimension is convenient for spreading out certain present strata and observing their tendency for us. In order to have history at all, human, biological, or geological, we must abstract and simplify as best we can within our complex present; we must try to understand the motives of past human history, for example, in the light of our own present tendencies; we must breathe into the symbolic structures of the dead past such soul as seems to be called for by their greater simplicity or complexity. But we must not be deceived into mistaking our constructions for reality. These past symbolic structures, once at any rate, had a soul of their own. In the case of our own childhood points of view,

moreover, while they are no longer real, we at least own them as once ours, and can contrast them with our present point of view as fading, symbolic structures.

In looking back at the historic series, as we have spread it out, it seems indeed to bear the stamp of necessity. But this necessity is merely subjective and *a posteriori*, and should not be read into the historic process. It simply means that we could not now take account of the facts in a different order or with a different meaning. Even with us, however, this meaning varies from time to time, is plastic in the hands of the successive moments of experience. If we look again into the making of history, we must not forget, however massive the accumulation of experience in the way of customs, language, and institutions may seem, that individuals built history and that the social products are the result of their accumulated purposes and failures. In the making, as well as now in the interpretation, the facts were plastic. While the facts now fitted in and seem the natural outgrowth of their predecessors, other facts, had they happened, would have fit in equally well by transforming their predecessors into terms of themselves. The facts themselves are gifts, therefore, and it is for us to fit them together as best may suit our purposes for the time being. The only place, where the past is determined or stereotyped, is in a stereotyped brain, in a mind that has substituted verbal counters for real meanings.

C. Knowledge of the Future. — The A Priori and Probable.

The future is like the past in so far that it has no content. What meaning it has is present meaning. But the past has at least a formal basis for reality. It has a chronology which is binding upon us. We must respect the records of the past as records. The future has not even formal reality. It knows no records, it respects no data. The future, therefore, is pure ideal construction. It has no factual basis even in the present.

The only basis for the future is a belief in the uniformity of nature, is a faith that the present attitudes are legislative for those to come. The future is the realm of the *a priori*, the present constitution of things extended into the unknown

dimension of that which is not yet. The future, therefore, based as it is upon general concepts abstracted from the individual character of reality, must always be hypothetical. Other things being equal, if our concepts hold, if the observed uniformities are real, such and such things will happen.

There is, therefore, no such thing as *prediction* in any real sense. The *pre* should at any rate be left out. Science, in its ideal construction, abstracts from the time aspect and emphasizes only the structural aspect of reality. In treating of the physical processes, stereotyped as they are, we do seem to have a case of mere repetition. But it would be mere dogmatism to suppose that even here we have a real repetition. It is simply repetition for us, as indeed scientific knowledge is only knowledge for us, a convenience for our adjustment.

If we take account of our own scientific attitudes, they surely are anything but stable. The so-called laws and axioms of science are being retranslated all the while. The only identity here is the identity of mere symbols, not of meaning surely. The symbols, $2 + 2 = 4$, may be the same, but our whole conception of number has been revolutionized within a generation. The axioms of geometry, which seemed so absolute even to the English empiricists, have been sadly torn to pieces within recent times and have received a new meaning altogether. The only thing that has been stable about the law of gravitation are the symbolic equations. The conception of the law itself is in the crucible of criticism. The law of conservation of energy is no longer dogmatically asserted even by physicists. La Grange grants that energy may disappear, and Maxwell that it may be increased through a sorting process. It is, however, an important working basis. In the light of history, therefore, it would be mere idiocy to suppose that our conceptual attitudes toward nature are stable.

When, again, we consider knowledge which is knowledge of the real, which deals with the plastic world of meaning, here, at any rate, mere *a priori* dogmatism soon proves its own absurdity. The man who makes the social and individual future out of the whole cloth of the present, who regards his private attitudes as legislative for the processes of history, is

bound to bitter disappointment, or at least to be the laughing stock of the future. The man who established the Dudlean lectureship at Harvard, in order that future ages might thunder forth their condemnation against 'the damnable heresies of the Catholic church,' would probably be as chagrined at the carrying out of the provisions of his will, as he is amusing to us. The world does move. A man by the name of Paine who gave five thousand dollars, something over a hundred years ago, to establish a trade school a hundred years in the future, did not realize that the apprentice system would vanish out of our institutions before then and that the courts of Massachusetts would have difficulty in translating his will into present purposes. Pessimistic theologians have mourned over the rejection of their religious concepts, their creeds of hell-fire, as Jonah mourned over his gourd, not realizing that it is more important that the universe should develop new meanings, than that it should be held in the death grip of their past concepts.

While we cannot anticipate that which is not created, while we cannot read off a meaning which can only come into being by a transformation of our present meaning, while it is always true that the present truth must die in order that the higher truth may come, it is true that the present makes certain demands upon itself, which the present does not satisfy. It may be that the demands are wrong, it may be that experience will embody the demands in a new and larger meaning, but in either case the present provides problems for the future and furnishes a certain direction to the future.

To recognize that the present makes demands upon itself which it cannot satisfy, is a very different thing, however, from holding that we now anticipate the fulfilment of these demands and compare our present meaning to a larger meaning. If so, knowledge would be complete now and eternally. We may realize that our hypotheses are inconsistent, and yet be limited to them. We believe that, somehow, knowledge will not stop there, that by creating new hypotheses and by fresh investigations there shall be a survival of the fittest, which will mean a greater approximation to truth, but if we could anticipate that truth now, we would be foolish not to stop working. Whether

right or wrong, we must make violence on the kingdom of heaven by striving to coerce reality to fulfil our demands or needs. Whether we succeed or fail, we shall gain experience, in the light of which our demands or needs shall have new meaning for us. What is needed is an open mind to meet the future without bias or prejudice and to act on the light as God gives us to see the light every moment of our experience.

Nor must we be overconsistent. It may be necessary even in science, though its aim is a consistent system of truth, to hold to contradictory hypotheses for the time being, when such hypotheses are useful in dealing with the facts. It may be that the contradiction is involved in the nature of things. If so, we shall have system in so far as it is possible, and we shall be better able to anticipate the behavior of things. It may be, and we have a deep-rooted faith that this is so, that the contradiction is due to our own chaotic purposes. If so, such a measure of meaning as we can reach will be a necessary step for further progress. Waiting can only mean failure in any case.

It is a safe rule to stick to all those demands which seem essential for the largest life, whether we at present can reconcile them or not. For purposes of knowing it may be important to emphasize the unity and sameness and wholeness of things. Science seems to need what James calls a solid block universe in order to make prediction possible. For purposes of action, on the other hand, it may be important to take account of the diversity and individuality, the changing and incomplete character of things. For ethics, for example, the universe must be regarded as essentially individual and plastic, as amenable to human purposes and as indeterminate in character, if the individual life is to count for something.

While no *a priori* proof has any coerciveness over the real future, and while it will be impossible, therefore, to prove immortality, yet if the belief in immortality is essential to our present stage of progress, why should we sacrifice it? What seems essential now may not seem so in later stages of development, and our beliefs are bound to have new meaning as we go on, yet our beliefs are good only insofar as they now help us to live

the richest possible life. The best religion, the absolute religion for us, is that which grows out of our present demands and meets our present needs.

Philosophy as a rule has emphasized the demand for unity and completeness. Yet no great philosopher, however strong his emphasis on that side, has been able to silence altogether the ethical demand. Leibnitz with his predeterminism holds that it is possible to determine oneself otherwise, to find one's own answer. Spinoza, the most cold-bloodedly consistent of them all, after having reduced the universe to a mere naturalistic determinism, in which our impulses and emotions must be what they are, finds in thinking the possibility of freedom. To have adequate ideas is to have adequate control. By thinking we can translate the blind impulsive and emotional life into a life of worth. Spinoza at least implies that a man ought to think.

It is well to keep in mind that knowledge does not exist for its own sake, but for the sake of the active self. Philosophy may have a creative function, such as poetry and art have. If by creating a certain kind of belief world we can attain to a larger life than we otherwise could, why is not the creation of such a belief world a legitimate thing, and why is it not a fact for the time being, as much as anything is a fact?

It seems evident, then, that our finite attitudes towards the universe are at best compromises. Sometimes they are contradictory, and only the more useful for it. When the Presbyterians added to their confession of preordination a clause on individual freedom and responsibility, they laid themselves open to the charge of inconsistency, but perhaps it was the best they could do, and at any rate they avowed openly what other religious creeds and philosophers imply. While consistency is important, our universe is too big for consistency, and we often have to hold on to postulates and hypotheses that conflict, because we cannot afford to do without any of them. They serve our needs. Perhaps the thinking and research of ages may resolve them into a more comprehensive view, perhaps they are involved in the very nature of things. In the meantime it behooves us to be modest; to be open minded; to allow fair play of opinions; and, while emphasizing what needs to be empha-

sized as we see it, to regard our results at best as decidedly provisional, stepping stones, let us hope, to better things.

"It may be that the gulfs will wash us down,
It may be we shall reach the Happy Isles,
But something ere the end, some work of noble note may yet be done."¹

¹ Huxley—Tennyson.

CHAPTER VI.

NON-BEING AND TIME.

In the light of the previous discussion, it may be well to examine afresh the concept of non-being. Historically viewed, there are two stages in this concept: the metaphysical stage, where non-being is affirmed or denied as an objective reality; and the logical or epistemological stage, where the discussion is transferred from the realm of objective reality to that of subjective attitudes.

A. *The Metaphysical Conception of Non-Being.*

The first to make prominent the concept of non-being in accounting for the world was Heracleitus. The flux of the perceptual world, the irreversibility of the observed processes, appeals to the genius of Heracleitus. Being cannot account for this flux, another principle must be found. It is because 'non-being sticks in being' that the universe is so unstable. To be sure Heracleitus could not be expected to be consistent. Owing to his lack of logical tools, the *ὄδος* seems to him as real as the flux and the process itself appears to be a circular one. There can be no doubt, however, of Heracleitus' recognition of non-being and its dynamic significance. To this the whole subsequent history of ancient philosophy testifies.

The refutation of non-being by Parmenides presupposes the ontological conception of Heracleitus and is limited by the same lack of logical tools. Parmenides holds that it is contradictory to assert non-being. If non-being is, it ceases to be non-being. It cannot be thought, "for it is the same thing that can be thought and that can be." Hence non-being is an illusion and the path, which asserts that non-being is, must be abandoned.

The difficulty with Parmenides is that he fails to distinguish between the thatness and the whatness of non-being. While the idea of non-being must exist as a state of consciousness, yet the character of non-being is precisely to make our judg-

ments of being relative. It is the very fact of the relativity of being for us which forces us to postulate an opposite principle. It is not necessary that the whatness of an idea should resemble its thatness. Sometimes, indeed, that may be so. The idea of red may be reddish, if we are visualizers. The present content, however, may be a mere spoken or written word with no resemblance to color. What content is actually present is irrelevant, if it means the same thing or property. In some cases the content is obviously merely symbolic. The idea of an infinitesimal quantity is not infinitesimal and the idea of contradictoriness is not contradictory. So far from the idea of contradictoriness being contradictory, it involves a demand for consistency. The whatness of an idea involves the whole attitude of the self towards a certain fact. It only approximates at best, as we have seen, in hitting the thatness or the fact. The fact of real non-being must be thought in order to introduce consistency into our judgments of being. The meaning of non-being is precisely the relativity of our meanings. Non-being, therefore, could not be deduced by any *a priori* logic. It can be inferred only *a posteriori*. Owing to the crudity of their logical distinctions, both Heracleitus and Parmenides failed to show the relation of non-being to being.

Besides the conception of dynamic non-being, 'sticking in being' and causing the flux of things, we have in early Greek philosophy the conception of static non-being, external to being. This is the conception of the void or empty space, as opposed to material entities. This conception, made prominent especially by the atomists, was also evolved to account for the apparent changes of reality. Such a conception, it was thought, would make possible the rearrangement or interaction of the permanent entities so as to account for the complex changes of our perceptual world. To the atomist, of course, the conception meant objective reality. It is, however, merely the conception of other being, absolute externality.

In Plato, we find all of the above attitudes toward non-being, besides another, which is typically his own. Perhaps no other concept shows better the complexity of the motives which meet in Plato. Plato cannot get away, somehow, from Heracleitus.

That we live in a world of flux is as obvious to Plato as to Heraclitus and is tinged with the same sadness, though Plato puts the emphasis on the *ἄδω*, or the eternal truth aspect, and denies the reality of the flux. To transcend the flux, to grasp the rational and eternal, the common and permanent, becomes with Plato an ethical duty. The world of flux is at best a world of semblance, the prison house of the soul.

But in Plato the scientific motive too is strong. He has great admiration for the physicists; and with them he assumes the void or a principle of pure passivity, as opposed to the world of being. The former affords the possibility of generating or mirroring the world of ideas, of which the phenomenal world is the semblance. But even here it is difficult for Plato to keep out the ethical motive. The *ὑλη* is not pure passivity merely, as is the atomist's void; it seems sometimes to offer resistance to the mirroring of ideas. Negativity becomes a principle of evil. Here the tendency to give non-being positive significance, as another form of static being, becomes even more prominent than with the atomists.

In the *Parmenides*, again, Plato takes the cue from his great predecessor and tries to get rid of non-being by showing its contradictoriness and, therefore, unreality. The one alone is. In the *Sophist*, Plato is unhampered by ethical considerations and considers the matter logically. Here he lays down five fundamental principles: Motion, rest, being, sameness and otherness. Sameness and otherness are here coördinate principles and coextensive with the whole of reality. Non-being here takes the form of other being or diversity, without which thinking is impossible. This, as we shall see, is the modern logical conception of non-being, only that with Plato the conception is metaphysical as well as logical.

Aristotle rejects empty space or the void as contradictory and useless. It is useless because it could be in no relation to being and, therefore, could account for no changes in being. In his discussion of change, however, he gives it a new meaning which is important. The void is nothing but the identity of stuff, or the zero in which opposites meet and pass into each other. It is like the mathematical point, not a positive magni-

tude. We cannot, however, divorce states from stuff. Hot and cold are in the same matter. The void, then, comes to mean that identity or limit by means of which opposites can interact. In the opposition of qualities through this identity, lies the possibility of change. Of course this limit is not merely an ideal limit, as it would be for us, but a metaphysical limit.

Non-being, however, has a more real significance for Aristotle than this. Affirmation and negation are both attributes of the real. Opposition of judgments is real opposition. In the *Physics*, Aristotle lays down three conditions for change: First, from existence to existence or physical motion; secondly, from existence to non-existence or decay; thirdly, from non-existence to existence or becoming. The latter two cannot be called motion according to Aristotle, as here we have to do with a relation between affirmation and negation, being and non-being. Beside non-being figuring as the limit of opposites, we have it here figuring as the real opposite of being. In Aristotle's concept of the potential and his attitude toward knowledge of the future, which we have referred to elsewhere, we have seen his emphasis of metaphysical non-being and its dynamic significance.

In closing our survey of the Greek attitudes toward non-being, it may be well to say a word about the mystic attitude. This grows out of the mystic definition of being. Being lies outside or beyond the universe of logical definition or reflective knowledge. Our ideas are abstract, partial and many. Reality is concrete, complete and one. Only in our moments of appreciation, in the ecstasy of feeling, when we cease reflecting and lose self-consciousness in the rapture and joy of communion with God, do we attain to reality. But this pure immediacy, which lies beyond thinking, can be nothing at all to thought, is a mere limit. Hence we cannot call it one as over against the many, for this implies thinking. It is mere zero, existence without content, as far as thought is concerned. But to him, who has passed beyond knowledge and lost himself in the larger life, it is fullness of joy and satisfying reality. Here, then, we have a peculiar form of the non-being of otherness, which we found in Plato. It is here the otherness of feeling or immediacy as a limit to thought.

The above may be regarded as a sufficient account of the metaphysical attitudes in regard to non-being. The metaphysical conceptions since may be regarded as reverberations of the ancient. The mediæval contrast of the *universalia ante rem* with the *universalia in re*, or the possible with the actual world, is merely the Platonic contrast between the eternal world and the ideas as mirrored or imitated in the world of generation.

Fichte's idea of the non-ego as posited by the ego is simply Plato's conception of non-being as otherness or difference. The idea of non-being as the irrational limit, as that which offers resistance to ideals or to the rational ego, which we find in Kant and Fichte, is only Plato's conception of non-being as evil over again, with a special ethical significance attached to the process. Hegel's reduction of being as mere immediacy, whether thatness or whatness, to non-being from the point of view of thought; his conception further of *negativität* as the limit, if not the mere identity of opposites and, therefore, making possible the dialectic movement from one category to another in the *Logic*; his launching or objectifying his logical system into the absolute otherness of nature which is made responsible for the distortions and contradictions in the categories, as thus appearing in time and space, — all these are conceptions familiar to us from Greek philosophy, the first two from Aristotle and the last from Plato at least. Schopenhauer's final conception of reality as the negation of individuality and thought, as that state which is nothing to our phenomenal thought world, but from the side of which our world fades away as nothing, is only the ancient mystic conception over again.

B. *The Logical Conception of Non-being.*

In modern discussion the problem of non-being has been transferred, with all other problems, from the realm of naïve objective existence to the realm of logical definition or subjective meanings. The question is not any longer what is the reality of non-being, but how must we conceive non-being or what do our negative judgments mean? This furnishes the proper point of departure. Real necessity and real objectivity must for us be first of all necessity and objectivity of thinking.

The question: What is real? can only be solved through the answer to the question: What concepts must we have, or what judgments must we make, in order to make our experience consistent to ourselves and properly meet our environment? The examination of being and non-being alike, therefore, means an examination of our judgments.

The question of the relation between our affirmative and negative judgments naturally suggests itself. We are not concerned here with the psychological question whether the affirmative type comes before the negative. This question, at any rate, ought not to be settled *a priori*. It might seem as though the affirmative judgment ought to come first and as though the negative must be one stage more remote, as though denial psychologically must have as a background an affirmative judgment or at least a 'suggestion' of an affirmative. If we were always judging consciousnesses, this would be plausible. But the process of judging is comparatively rare. Consciousness dispenses with thinking, whenever thinking is unnecessary; and thinking is only necessary when the conditions are unusual, *i. e.*, when our instinctive or habitual adjustments fail. It would seem, therefore, that our first thinking consciousness is a shock of discrepancy, is negative rather than positive. To be sure it presupposes experience, but not thinking experience, either as a direct affirmation or a suggestion of affirmation. This is a matter at any rate for psychological investigation, not for logical dogmatism, such distinguished authorities as Sigwart and Bosanquet to the contrary notwithstanding.

In regard to the problem, whether all affirmation means negation or vice versa, there has been a similar mixing of psychological and logical considerations. Psychologically considered, the man who means to deny, probably does not mean to affirm; and the man who affirms, does not mean to deny. This is simply the psychologist's fallacy of reading into the state of actual denying and actual affirming the standpoint of the observer, the impartial spectator, whether a later moment or an outside spectator, who is concerned with neither affirming nor denying, who is not dealing with real issues at all, but dealing with the subjective attitudes as such. He sees that the

attitude of affirming destroys the other possibilities, whether known to the affirmer or not, and that the attitude of denying must have some reference to truth and, in the case of disjunction at least, does narrow down the possibilities and so affirms. The reference to truth, as we have seen elsewhere, may be merely a reference to a demand for truth, which makes it impossible to affirm a contradiction as final, but does not necessarily mean the reference to a system of truth, though of course sometimes it means that.

The logical question is whether affirmation and negation are really different attitudes, in other words, whether they are equally fundamental. To this question there can be only one answer. When we mean to deny, we mean to deny; when we mean to affirm, we mean to affirm. Let us now inquire a little more specifically into the meaning of our negative judgments and what conception of reality they force upon us.

1. *The Conception of Non-being as Limit or Position, Existence Without Content.* — Such a conception of non-being we become conscious of when we try to define experience which is not of the reflective type. The definition of immediacy must be merely negative, can at most indicate the conditions under which such experience may be had. It cannot give us an equivalent for such experience. The leap, involved in passing from the reflective to the non-reflective type of experience, can only be indicated in thought by zero. This led the Mystics, who regarded reality as essentially non-reflective, to indicate reality by zero.

But even on the reflective level, the beginning of a certain thought consciousness, its continuity with another kind of reflective attitude, as well as with the non-reflective, must be for thought a mere limit or zero. Thought does not account for beginnings, it must take facts as its starting point, it can only systematize that which is. The leap from one kind of thought consciousness to another lies outside or beyond the specific thought attitude which dominates consciousness. Thus to the counting consciousness the preceding non-counting consciousness is a mere limit or zero. One or first is already a step or act in the counting consciousness. In order to mark this off as a step having a similar

place in the series to the succeeding steps, we must mark it off from the preceding non-counting consciousness, which thus becomes the limit or zero of the process. The zero of addition, as $n + y = 0$, simply means that numerical value is inapplicable to the facts with which we deal. Thus righteousness and peace = 0.

2. *The Conception, of Non-being as Otherness or Contrast or Difference.* — This type of negative judgment has been well discussed by Teichmüller in his *Metaphysics*. We may contrast one grade of reality with another, or we may contrast differences within the same grade. We shall always find, as Plato indicates, that, wherever we can make judgments of sameness, there we can also make judgments of otherness.

We may make the judgment: Circles do not exist, which involves a contrast between the ideal world of geometry and the world of perception; or we may make the judgment that circles are not triangles, which means that one concept is not another. Or we may say that men are not winged, which means that we deny a certain attribute to man on account of other characteristics, which exclude such an attribute. Or we may say that man is not a monkey, which contrasts one class of individuals with another.

We have been dealing with our judgments of non-being merely from the subjective point of view, or with reference to ideal construction, whether in our conception of non-being as limit or as contrast. That one subjective attitude is not another does not denote any lack or negativity on the part of reality itself. In reality there is continuity, not merely conceptual limits. In reality one quality, one concept, or one individual, does not try to occupy the space of another and is not excluded or negated by the other. The more fundamental question arises therefore: Do we have to predicate real non-being, in order to account for the character of such judgments as we have to make in regard to reality?

3. *The Conception of Non-being as Substantial, Dynamic Non-being.* — If we examine carefully the nature of knowledge, we shall find, I think, that it cannot be made intelligible by the presupposition of merely positive characteristics on the

part of reality. I shall merely indicate the reasons here, as they have been dealt with under other heads.

In the first place, without assuming real non-being, the judging process itself would be impossible. The act of judgment presupposes that certain aspects have been torn loose from reality, that some contents, more general and permanent than the rest, have been discriminated and abstracted in the process of experience and have become symbolic of other contents. In a static world, distinctions between thought and reality could never have risen. Consciousness and object would there at any rate be inseparably agglutinated, if there could be consciousness at all in such a world. Judgments are progressive adjustments, which could be possible only in a world which, on the one hand, makes the individual dependent upon centers of reality beyond his own and, on the other hand, through a process of interaction and the survival of the fittest among such adjustments, makes it possible for us to meet, at least approximately, the demands of the other centers upon us and so realize our needs. Judgments, therefore, both as regards their genesis and as regards the testing of their validity, presuppose process and plurality as involved in the constitution of reality. Hence the possibility of judgments presupposes non-being, not negativity in general as an abstract logical category, as Bosanquet has it, but real or dynamic non-being.

But, secondly, we have seen that many judgments or concepts which we have, could become intelligible as regards their own specific meaning, only if we presuppose real non-being. Such concepts or judging attitudes as past and future, we have seen, presuppose real or dynamic non-being in order to have any meaning at all. In human experience, at least, there is real vanishing of content and real novelty. This can only be accounted for by the real transmuting of the structural aspect of the world into ever new significance.

But not only in the historic concepts, which illustrate in a special way the non-being character, but also in our other fundamental concepts we have found that non-being is involved. Thus we found that continuity becomes unintelligible apart from process, apart from the fusing of one positive characteristic or

position into another, as for example in the motion of the point to make a line. Positions must be looked upon as secondary abstractions from continuous process. Number presupposes, we found, cumulative process for its significance. So the zero of subtraction in mathematics, as in $x - y = 0$, presupposes at least ideal destruction of possibilities. The concept of the infinite, again, would be impossible except for a thought activity which can abstract from its limitations and thus conceive itself, in obedience to a certain purpose, as creative of new steps, 'world without end.' Even space, the type of the coexistent and the eternal, at least insofar as it presupposes continuity, we found to be unintelligible apart from motion and non-being. And so with other fundamental concepts.

But, thirdly, the incompatibility of our judgments and attitudes, which claim to be of the same (object) and by the same (subject), makes it necessary to suppose that reality at the same point is unstable; that our judgments vary, because they are made of a different reality, and by a different subject; that, in other words, we have different strata or transformations of being at the same point, necessitating different judgments.

At last, then, we are able to place time and non-being with reference to each other and to define one in terms of the other. Non-being, it would seem, is the genus within which time is a species. Non-being, we have found, includes our judgments, both of relative or ideal negation and of absolute negation. The character of time coincides with this latter species of non-being. Time is absolute or dynamic non-being.

This absolute non-being is forced upon us, we have seen, by the instability of the universe, including the universe of truth; it is invented to account for passing away and novelty. Change could not be produced, as modern science seems to imply, by the mere juxtaposition of static entities or substances. We need a negative property, as well as positive properties, to make change possible. We depend upon the nature processes to do the work, we can merely arrange the conditions. But we must not suppose that the conditions, which are our ideal conceptions, are all there is to change.

The function of thought, in the perpetual flux of the universe,

must be a directive one. Thought cannot stop the ceaseless processes from working. They work whether we will or no, whether we are awake or asleep, purposive or purposeless. But while thought cannot stop the flux of things, it can give it direction or character by means of its grasp of the meaning of the present and by the proper arrangement of conditions for the untiring nature processes to work out. By the harnessing of the forces of the universe to our purposes, by giving the restless processes the proper grist to grind, we can give meaning to the flux. While things must change, while there must, therefore, be novelty, the quality of this novelty will depend upon the directive meaning we put into the change. In the end the flux will transmute the meanings as well as their objects, the traveler as well as the path; it is for us to say what significance the transmutation shall have, whether purposive or mere chance. Thus we can be creators of a new heaven and a new earth, a new cosmos, instead of allowing the universe to revert to its primitive chaos. Thus we can become masters of the show, prophets instead of mere puppets. In the flux of things the soul can build itself nobler mansions, or, if not nobler, mansions that are more homelike and that better fit its needs. The new wine at any rate requires new bottles, concepts must be remade to fit the demands of a changing environment and a growing consciousness.

In the process of survival, in the history of knowledge, the only demand which has so far proved permanent, is the demand for truth. In the flux of thought this alone has proved *a priori*. In confronting the unknown future, therefore, while recognizing that the process of survival is still going on, we have at least this faith that the spirit of truth shall abide. But this spirit of truth involves a candid recognition of the limitations of truth in the abstract, its dependence upon the larger demand for life, and its subordination, if need be, to this demand.