

## Lecture VII. The Definition of Perception

In Lecture V we found reason to think that the ultimate constituents\* of the world do not have the characteristics of either mind or matter as ordinarily understood: they are not solid persistent objects moving through space, nor are they fragments of "consciousness." But we found two ways of grouping particulars, one into "things" or "pieces of matter," the other into series of "perspectives," each series being what may be called a "biography." Before we can define either sensations or images, it is necessary to consider this twofold classification in somewhat greater detail, and to derive from it a definition of perception. It should be said that, in so far as the classification assumes the whole world of physics (including its unperceived portions), it contains hypothetical elements. But we will not linger on the grounds for admitting these, which belong to the philosophy of physics rather than of psychology.

\* When I speak of "ultimate constituents," I do not mean necessarily such as are theoretically incapable of analysis, but only such as, at present, we can see no means of analysing. I speak of such constituents as "particulars," or as "RELATIVE particulars" when I wish to emphasize the fact that they may be themselves complex.

The physical classification of particulars collects together all those that are aspects of one "thing." Given any one particular, it is found often (we do not say always) that there are a number of other particulars differing from this one in gradually increasing degrees. Those (or some of those) that differ from it only very slightly will be found to differ approximately according to certain laws which may be called, in a generalized sense, the laws of "perspective"; they include the ordinary laws of perspective as a special case. This approximation grows more and more nearly exact as the difference grows less; in technical language, the laws of perspective account for the differences to the first order of small quantities, and other laws are only required to account for second-order differences. That is to say, as the difference diminishes, the part of the difference which is not according to the laws of perspective diminishes much more rapidly, and bears to the total difference a ratio which tends towards zero as both are made smaller and smaller. By this means we can theoretically collect together a number of particulars which may be defined as the "aspects" or "appearances" of one thing at one time. If the laws of perspective were sufficiently known, the connection between different aspects would be expressed in differential equations.

This gives us, so far, only those particulars which constitute one thing at one time. This set of particulars may be called a "momentary thing." To define that series of "momentary things" that constitute the successive states of one thing is a problem involving the laws of dynamics. These give the laws governing the changes of aspects from one time to a slightly later time, with the same sort of differential approximation to exactness as we obtained for spatially neighbouring aspects through the laws of perspective. Thus a momentary thing is a set of particulars, while a thing (which may be identified with the whole history of the thing) is a series of such sets of particulars. The particulars in one set are collected together by the laws of perspective; the successive sets are collected together by the laws of dynamics. This is the view of the world which is appropriate to traditional physics.

The definition of a "momentary thing" involves problems concerning time, since the particulars constituting a momentary thing will not be all simultaneous, but will travel outward from the thing with the velocity of light (in case the thing is in vacuo). There are complications connected with relativity, but for our present purpose they are not vital, and I shall ignore them.

Instead of first collecting together all the particulars constituting a momentary thing, and then forming the series of successive sets, we might have first collected together a series of successive aspects related by the laws of dynamics, and then have formed the set of such series related by the laws of perspective. To illustrate by the case of an actor on the stage: our first plan was to collect together all the aspects which he presents to different spectators at one time, and then to form the series of such sets. Our second plan is first to collect together all the aspects which he presents successively to a given spectator, and then to do the same thing for the other spectators, thus forming a set of series instead of a series of sets. The first plan tells us what he does; the second the impressions he produces. This second way of classifying particulars is one which obviously has more relevance to psychology than the other. It is partly by this second method of classification that we obtain definitions of one "experience" or "biography" or "person." This method of classification is also essential to the definition of sensations and images, as I shall endeavour to prove later on. But we must first amplify the definition of perspectives and biographies.

In our illustration of the actor, we spoke, for the moment, as though each spectator's mind were wholly occupied by the one actor. If this were the case, it might be possible to define the biography of one spectator as a series of successive aspects of the actor related according to the laws of dynamics. But in fact this is not the case. We are at all times during our waking life receiving a variety of impressions, which are aspects of a variety of things. We have to consider what binds together two simultaneous sensations in one person, or, more generally, any two occurrences which form part of one experience. We might say, adhering to the standpoint of physics, that two aspects of different things belong to the same perspective when they are in the same place. But this would not really help us, since a "place" has not yet been defined. Can we define what is meant by saying that two aspects are "in the same place," without introducing anything beyond the laws of perspective and dynamics?

I do not feel sure whether it is possible to frame such a definition or not; accordingly I shall not assume that it is possible, but shall seek other characteristics by which a perspective or biography may be defined.

When (for example) we see one man and hear another speaking at the same time, what we see and what we hear have a relation which we can perceive, which makes the two together form, in some sense, one experience. It is when this relation exists that two occurrences become associated. Semon's "engram" is formed by all that we experience at one time. He speaks of two parts of this total as having the relation of "Nebeneinander" (M. 118; M.E. 33 ff.), which is reminiscent of Herbart's "Zusammen." I think the relation may be called simply "simultaneity." It might be said that at any moment all sorts of things that are not part of my experience are happening in the world, and that therefore the relation we are seeking to define cannot be merely simultaneity. This, however, would be an error--the sort of error that the theory of relativity avoids. There is

not one universal time, except for an elaborate construction, there are only local times, each of which may be taken to be the time within one biography. Accordingly, if I am (say) hearing a sound, the only occurrences that are, in any simple sense, simultaneous with my sensation are events in my private world, i.e. in my biography. We may therefore define the "perspective" to which the sensation in question belongs as the set of particulars that are simultaneous with this sensation. And similarly we may define the "biography" to which the sensation belongs as the set of particulars that are earlier or later than, or simultaneous with, the given sensation. Moreover, the very same definitions can be applied to particulars which are not sensations. They are actually required for the theory of relativity, if we are to give a philosophical explanation of what is meant by "local time" in that theory. The relations of simultaneity and succession are known to us in our own experience; they may be analysable, but that does not affect their suitability for defining perspectives and biographies. Such time-relations as can be constructed between events in different biographies are of a different kind: they are not experienced, and are merely logical, being designed to afford convenient ways of stating the correlations between different biographies.

It is not only by time-relations that the parts of one biography are collected together in the case of living beings. In this case there are the mnemonic phenomena which constitute the unity of one "experience," and transform mere occurrences into "experiences." I have already dwelt upon the importance of mnemonic phenomena for psychology, and shall not enlarge upon them now, beyond observing that they are what transforms a biography (in our technical sense) into a life. It is they that give the continuity of a "person" or a "mind." But there is no reason to suppose that mnemonic phenomena are associated with biographies except in the case of animals and plants.

Our two-fold classification of particulars gives rise to the dualism of body and biography in regard to everything in the universe, and not only in regard to living things. This arises as follows. Every particular of the sort considered by physics is a member of two groups (1) The group of particulars constituting the other aspects of the same physical object; (2) The group of particulars that have direct time-relations to the given particular.

Each of these is associated with a place. When I look at a star, my sensation is (1) A member of the group of particulars which is the star, and which is associated with the place where the star is; (2) A member of the group of particulars which is my biography, and which is associated with the place where I am.\*

\*I have explained elsewhere the manner in which space is constructed on this theory, and in which the position of a perspective is brought into relation with the position of a physical object ("Our Knowledge of the External World," Lecture III, pp. 90, 91).

The result is that every particular of the kind relevant to physics is associated with TWO places; e.g. my sensation of the star is associated with the place where I am and with the place where the star is. This dualism has nothing to do with any "mind" that I may be supposed to possess; it exists in exactly the same sense if I am replaced by a photographic plate. We may call the two places the active and passive places respectively.\* Thus in the case of a perception or photograph of a star, the active place is the place where the star is, while the passive place is the place where the percipient or photographic plate is.

\* I use these as mere names; I do not want to introduce any notion of "activity."

We can thus, without departing from physics, collect together all the particulars actively at a given place, or all the particulars passively at a given place. In our own case, the one group is our body (or our brain), while the other is our mind, in so far as it consists of perceptions. In the case of the photographic plate, the first group is the plate as dealt with by physics, the second the aspect of the heavens which it photographs. (For the sake of schematic simplicity, I am ignoring various complications connected with time, which require some tedious but perfectly feasible elaborations.) Thus what may be called subjectivity in the point of view is not a distinctive peculiarity of mind: it is present just as much in the photographic plate. And the photographic plate has its biography as well as its "matter." But this biography is an affair of physics, and has none of the peculiar characteristics by which "mental" phenomena are distinguished, with the sole exception of subjectivity.

Adhering, for the moment, to the standpoint of physics, we may define a "perception" of an object as the appearance of the object from a place where there is a brain (or, in lower animals, some suitable nervous structure), with sense-organs and nerves forming part of the intervening medium. Such appearances of objects are distinguished from appearances in other places by certain peculiarities, namely

- (1) They give rise to mnemonic phenomena;
- (2) They are themselves affected by mnemonic phenomena.

That is to say, they may be remembered and associated or influence our habits, or give rise to images, etc., and they are themselves different from what they would have been if our past experience had been different--for example, the effect of a spoken sentence upon the hearer depends upon whether the hearer knows the language or not, which is a question of past experience. It is these two characteristics, both connected with mnemonic phenomena, that distinguish perceptions from the appearances of objects in places where there is no living being.

Theoretically, though often not practically, we can, in our perception of an object, separate the part which is due to past experience from the part which proceeds without mnemonic influences out of the character of the object. We may define as "sensation" that part which proceeds in this way, while the remainder, which is a mnemonic phenomenon, will have to be added to the sensation to make up what is called the "perception." According to this definition, the sensation is a theoretical core in the actual experience; the actual experience is the perception. It is obvious that there are grave difficulties in carrying out these definitions, but we will not linger over them. We have to pass, as soon as we can, from the physical standpoint, which we have been hitherto adopting, to the standpoint of psychology, in which we make more use of introspection in the first of the three senses discussed in the preceding lecture.

But before making the transition, there are two points which must be made clear. First: Everything outside my own personal biography is outside my experience; therefore if anything can be known by me outside my biography, it can only be known in one of two ways

- (1) By inference from things within my biography, or
- (2) By some a priori principle independent of experience.

I do not myself believe that anything approaching certainty is to be attained by either of these methods, and therefore whatever lies outside my personal biography must be regarded, theoretically, as hypothesis. The theoretical argument for adopting the hypothesis is that it simplifies the

statement of the laws according to which events happen in our experience. But there is no very good ground for supposing that a simple law is more likely to be true than a complicated law, though there is good ground for assuming a simple law in scientific practice, as a working hypothesis, if it explains the facts as well as another which is less simple. Belief in the existence of things outside my own biography exists antecedently to evidence, and can only be destroyed, if at all, by a long course of philosophic doubt. For purposes of science, it is justified practically by the simplification which it introduces into the laws of physics. But from the standpoint of theoretical logic it must be regarded as a prejudice, not as a well-grounded theory. With this proviso, I propose to continue yielding to the prejudice.

The second point concerns the relating of our point of view to that which regards sensations as caused by stimuli external to the nervous system (or at least to the brain), and distinguishes images as "centrally excited," i.e. due to causes in the brain which cannot be traced back to anything affecting the sense-organs. It is clear that, if our analysis of physical objects has been valid, this way of defining sensations needs reinterpretation. It is also clear that we must be able to find such a new interpretation if our theory is to be admissible.

To make the matter clear, we will take the simplest possible illustration. Consider a certain star, and suppose for the moment that its size is negligible. That is to say, we will regard it as, for practical purposes, a luminous point. Let us further suppose that it exists only for a very brief time, say a second. Then, according to physics, what happens is that a spherical wave of light travels outward from the star through space, just as, when you drop a stone into a stagnant pond, ripples travel outward from the place where the stone hit the water. The wave of light travels with a certain very nearly constant velocity, roughly 300,000 kilometres per second. This velocity may be ascertained by sending a flash of light to a mirror, and observing how long it takes before the reflected flash reaches you, just as the velocity of sound may be ascertained by means of an echo.

What it is that happens when a wave of light reaches a given place we cannot tell, except in the sole case when the place in question is a brain connected with an eye which is turned in the right direction. In this one very special case we know what happens: we have the sensation called "seeing the star." In all other cases, though we know (more or less hypothetically) some of the correlations and abstract properties of the appearance of the star, we do not know the appearance itself. Now you may, for the sake of illustration, compare the different appearances of the star to the conjugation of a Greek verb, except that the number of its parts is really infinite, and not only apparently so to the despairing schoolboy. In vacuo, the parts are regular, and can be derived from the (imaginary) root according to the laws of grammar, i.e. of perspective. The star being situated in empty space, it may be defined, for purposes of physics, as consisting of all those appearances which it presents in vacuo, together with those which, according to the laws of perspective, it would present elsewhere if its appearances elsewhere were regular. This is merely the adaptation of the definition of matter which I gave in an earlier lecture. The appearance of a star at a certain place, if it is regular, does not require any cause or explanation beyond the existence of the star. Every regular appearance is an actual member of the system which is the star, and its causation is entirely internal to that system. We may express this by saying that a regular appearance is due to the star alone, and is actually part of the star, in the sense in which a man is part of the human race.

But presently the light of the star reaches our atmosphere. It begins to be refracted, and dimmed by mist, and its velocity is slightly diminished. At last it reaches a human eye, where a complicated process takes place, ending in a sensation which gives us our grounds for believing in all that has gone before. Now, the irregular appearances of the star are not, strictly speaking, members of the system which is the star, according to our definition of matter. The irregular appearances, however, are not merely irregular: they proceed according to laws which can be stated in terms of the matter through which the light has passed on its way. The sources of an irregular appearance are therefore twofold:

- (1) The object which is appearing irregularly;
- 2) The intervening medium.

It should be observed that, while the conception of a regular appearance is perfectly precise, the conception of an irregular appearance is one capable of any degree of vagueness. When the distorting influence of the medium is sufficiently great, the resulting particular can no longer be regarded as an appearance of an object, but must be treated on its own account. This happens especially when the particular in question cannot be traced back to one object, but is a blend of two or more. This case is normal in perception: we see as one what the microscope or telescope reveals to be many different objects. The notion of perception is therefore not a precise one: we perceive things more or less, but always with a very considerable amount of vagueness and confusion.

In considering irregular appearances, there are certain very natural mistakes which must be avoided. In order that a particular may count as an irregular appearance of a certain object, it is not necessary that it should bear any resemblance to the regular appearances as regard its intrinsic qualities. All that is necessary is that it should be derivable from the regular appearances by the laws which express the distorting influence of the medium. When it is so derivable, the particular in question may be regarded as caused by the regular appearances, and therefore by the object itself, together with the modifications resulting from the medium. In other cases, the particular in question may, in the same sense, be regarded as caused by several objects together with the medium; in this case, it may be called a confused appearance of several objects. If it happens to be in a brain, it may be called a confused perception of these objects. All actual perception is confused to a greater or less extent.

We can now interpret in terms of our theory the distinction between those mental occurrences which are said to have an external stimulus, and those which are said to be "centrally excited," i.e. to have no stimulus external to the brain. When a mental occurrence can be regarded as an appearance of an object external to the brain, however irregular, or even as a confused appearance of several such objects, then we may regard it as having for its stimulus the object or objects in question, or their appearances at the sense-organ concerned. When, on the other hand, a mental occurrence has not sufficient connection with objects external to the brain to be regarded as an appearance of such objects, then its physical causation (if any) will have to be sought in the brain. In the former case it can be called a perception; in the latter it cannot be so called. But the distinction is one of degree, not of kind. Until this is realized, no satisfactory theory of perception, sensation, or imagination is possible.

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