

DIMENSIONS OF PERCEPTION

UNVEILING THE SYSTEM OF RELATIONS

It is because there is such a system of relations that we can speak of things as of this shape or of that, as great or small, as near or far, as here or there. Now, I ask, is there any reason to believe that, when the plain man speaks of space, the word means to him anything more than this system of actual and possible relations of arrangement among the touch things that constitute his real world? He may talk sometimes as though space were some kind of a thing, but he does not really think of it as a thing. This is evident from the mere fact that he is so ready to make about it affirmations that he would not venture to make about things. It does not strike him as inconceivable that a given material object should be annihilated; it does strike him as inconceivable that a portion of space should be blotted out of existence.

Why this difference? Is it not explained when we recognize that space is but a name for all the actual and possible relations of arrangement in which things in the touch world may stand? We cannot drop out some of these relations and yet keep space, the system of relations which we had before. That this is what space means, the plain man may not recognize explicitly, but he certainly seems to recognize it implicitly in what he says about space. Men are rarely inclined to admit that space is a thing of any kind, nor are they much more inclined to regard it as a quality of a thing. Of what could it be the quality?

And if space really were a thing of any sort, would it not be the height of presumption for a man, in the absence of any direct evidence from observation, to say how much there is of it—to declare it infinite? Men do not hesitate to say that space must be infinite. But when we realize that we do not mean by space merely the actual relations which exist between the touch things that make up the world, but also the possible relations, that we mean the whole plan of the world system, we can see that it is not unreasonable to speak of space as infinite. The material universe may, for aught we know, be limited in extent. The actual space relations in which things stand to each other may not be limitless.

But these actual space relations taken alone do not constitute space. Men have often asked themselves whether they should conceive of the universe as limited and surrounded by void space. It is not nonsense to speak of such a state of things. It would, indeed, appear to be nonsense to say that, if the universe is limited, it does not lie in void space. What can we mean by void space but the system of possible relations in which things, if they exist, must stand? To say that, beyond a certain point, no further relations are possible, seems absurd. When a man has come to understand what we have a right to mean by space, it does not imply a boundless conceit on his part to hazard the statement that space is infinite.

When he has said this, he has said very little. What shall we say to the statement that space is infinitely divisible? To understand the significance of this statement we must come back to the distinction between appearances and the real things for which they stand as signs, the distinction discussed at length in the last chapter. When I see a tree from a distance, the visual experience which I have is, as we have seen, not an indivisible unit, but is a complex experience; it has parts, and these parts are related to each other; in other words, it has both "matter" and "form." It is, however, one thing to say that this experience has parts, and it is another to say that it has an infinite number of parts.

No man is conscious of perceiving an infinite number of parts in the patch of color which represents to him a tree at a distance; to say that it is constituted of such strikes us in our moments of sober reflection as a monstrous statement. Now, this visual experience is to us the sign of the reality, the real tree; it is not taken as the tree itself. When we speak of the size, the shape, the number of parts, of the tree, we do not have in mind the size, the shape, the number of parts, of just this experience.

We pass from the sign to the thing signified, and we may lay our hand upon this thing, thus gaining a direct experience of the size and shape of the touch object. We must recognize, however, that just as no man is conscious of an infinite number of parts in what he sees, so no man is conscious of an infinite number of parts in what he touches.

He who tells me that, when I pass my finger along my paper cutter, what I perceive has an infinite number of parts, tells me what seems palpably untrue. When an object is very small, I can see it, and I cannot see that it is composed of parts; similarly, when an object is very small, I can feel it with my finger, but I cannot distinguish its parts by the sense of touch. There seem to be limits beyond which I cannot go in either case. Nevertheless, men often speak of thousandths of an inch, or of millionths of an inch, or of distances even shorter.

Have such fractions of the magnitudes that we do know and can perceive any real existence? The touch world of real things as it is revealed in our experience does not appear to be divisible into such; it does not appear to be divisible even so far, and much less does it appear to be infinitely divisible. But have we not seen that the touch world given in our experience must be taken by the thoughtful man as itself the sign or appearance of a reality more ultimate? The speck which appears to the naked eye to have no parts is seen under the microscope to have parts; that is to say, an experience apparently not extended has become the sign of something that is seen to have part out of part.

We have as yet invented no instrument that will make directly perceptible to the finger tip an atom of hydrogen or of oxygen, but the man of science conceives of these little things as though they could be perceived. They and the space in which they move—the system of actual and possible relations between them—seem to be related to the world revealed in touch very much as the space revealed in the field of the microscope is related to the space of the speck looked at with the naked eye.

When the thoughtful man speaks of real space, he cannot mean by the word only the actual and possible relations of arrangement among the things and the parts of things directly revealed to his sense of touch. He may speak of real things too small to be thus perceived, and of their motion as through spaces too small to be perceptible at all. What limit shall he set to the possible subdivision of real things?

Unless he can find an ultimate reality which cannot in its turn become the appearance or sign of a further reality, it seems absurd to speak of a limit at all. We may, then, say that real space is infinitely divisible. By this statement we should mean that certain experiences may be represented by others, and that we may carry on our division in the case of the latter, when a further subdivision of the former seems out of the question. But it should not mean that any single experience furnished us by any sense, or anything that we can represent in the imagination, is composed of an infinite number of parts.

When we realize this, do we not free ourselves from the difficulties which seemed to make the motion of a point over a line an impossible absurdity? The line as revealed in a single experience either of sight or of touch is not composed of an infinite number of parts. It is composed of points seen or touched—least experiences of sight or touch, *minima sensibilia*. These are next to each other, and the point, in moving, takes them. But such a single experience is not what we call a line. It is but one experience of a line. Though the experience is not infinitely divisible, the line may be. This only means that the visual or tactual point of the single experience may stand for, may represent, what is not a mere point but has parts, and is, divisible.

Who can set a limit to such possible substitutions? in other words, who can set a limit to the divisibility of a real line? It is only when we confuse the single experience with the real line that we fall into absurdities. What the mathematician tells us about real points and real lines has no bearing on the constitution of the single experience and its parts.

When he tells us that between any points on a line there are an infinite number of other points, he only means that we may expand the line indefinitely by the system of substitutions described above. We do this for ourselves within limits every time that we approach from a distance a line drawn on a blackboard. The mathematician has generalized our experience for us, and that is all he has done. We should try to get at his real meaning, and not quote him as supporting an absurdity.

TIME AS NECESSARY, INFINITE, AND INFINITELY DIVISIBLE.—Of course, we all know something about time; we know it as past, present, and future; we know it as divisible into parts, all of which are successive; we know that whatever happens must happen in time. Those who have thought a good deal about the matter are apt to tell us that time is a necessity of thought, we cannot but think it; that time is and must be infinite; and that it is infinitely divisible.

These are the same statements that were made regarding space, and, as they have to be criticised in just the same way, it is not necessary to dwell upon them at great length. However, we must not pass them over altogether. As to the statement that time is a necessary idea, we may freely admit that we cannot in thought annihilate time, or think it away. It does not seem to mean anything to attempt such a task. Whatever time may be, it does not appear to be a something of such a nature that we can demolish it or clear it away from something else. But is it necessarily absurd to speak of a system of things—not, of course, a system of things in which there is change, succession, an earlier and a later, but still a system of things of some sort—in which there obtain no time relations?

The problem is, to be sure, of theoretical interest merely, for such a system of things is not the world we know. And as for the infinity of time, may we not ask on what ground any one ventures to assert that time is infinite? No man can say that infinite time is directly given in his experience. If does not directly perceive it to be infinite, must one not seek for some proof of the fact?

The only proof which appears to be offered us is contained in the statement that we cannot conceive of a time before which there was no time, nor of a time after which there will be no time; a proof which is no proof, for written out at length it reads as follows: we cannot conceive of a time in the time before which there was no time, nor of a time in the time after which there will be no time. As well say: We cannot conceive of a number the number before which was no number, nor of a number the number after which will be no number.

Whatever may be said for the conclusion arrived at, the argument is a very poor . When we turn to the consideration of time as infinitely divisible, we seem to find ourselves confronted with the same difficulties which presented themselves when we thought of space as infinitely divisible. Certainly no man was immediately conscious of an infinite number of parts in the minute which just slipped by. Shall he assert that it did, nevertheless, contain an infinite number of parts? Then how did it succeed in passing? how did it even begin to pass away?

It is infinitely divisible, that is, there is no end to the number of parts into which it may be divided; those parts and parts of parts are all successive, no two can pass at once, they must all do it in a certain order, one after the other. something must pass first. What can it be? If that something has parts, is divisible, the whole of it cannot pass first. It must itself pass bit by bit, as must the whole minute; and if it is infinitely divisible we have precisely the problem that we had at the outset.

Whatever passes first cannot, then, have parts. Let us assume that it has no parts, and bid it Godspeed! Has the minute begun? Our minute is, by hypothesis, infinitely divisible; it is composed of parts, and those parts of other parts, and so on without end. We cannot by subdivision come to any part which is itself not composed of smaller parts. The partless thing that passed, then, is no part of the minute. That is all still waiting at the gate, and no member of its troop can prove that it has a right to lead the rest. In the same outer darkness is waiting the point on the line that misbehaved itself in the last chapter.

THE PROBLEM OF PAST, PRESENT, AND FUTURE.—It seems bad enough to have on our hands a minute which must pass away in successive bits, and to discover that no bit of it can possibly pass first. But if we follow with approval the reflections of certain thinkers, we may find ourselves at such a pass that we would be glad to be able to prove that we may have on our hands a minute of any sort. Men sometimes are so bold as to maintain that they know time to be infinite; would it not be well for them to prove first that they can know time at all?

The trouble is this; as was pointed out long ago by in his famous "Confessions," the parts of time are successive, and of the three divisions, past, present, and future, only one can be regarded as existing: "Those times, past and future, how can they be, when the past is not now, and the future is not yet?" The present is, it seems, the only existent; how long is the present? "Even a single hour passes in fleeting moments; as much of it as has taken flight is past, what remains is future. If we can comprehend any time that is divisible into no parts at all, or perhaps into the minutest parts of moments, this alone let us call present; yet this speeds so hurriedly from the future to the past that it does not endure even for a little space.

If it has duration, it is divided into a past and a future; but the present has no duration. "Where, then, is the time that we may call long? Is it future? We do not say of the future: it is long; for as yet there exists nothing to be long. We say: it will be long. But when? If while yet future it will not be long, for nothing will yet exist to be long. And if it will be long, when, from a future as yet nonexistent, it has become a present, and has begun to be, that it may be something that is long, then present time cries out in the words of the preceding paragraph that it cannot be long."

Augustine's way of presenting the difficulty is a quaint one, but the problem is as real at the beginning of the century as it was at the beginning of the fifth. Past time does not exist now, future time does not exist yet, and present time, it seems, has no duration. Can a man be said to be conscious of time as past, present, and future? Who can be conscious of the nonexistent?

And the existent is not time, it has no duration, there is no before and after in a mere limiting point. The trouble is this; as was pointed out long ago by in his famous "Confessions," the parts of time are successive, and of the three divisions, past, present, and future, only one can be regarded as existing: "Those times, past and future, how can they be, when the past is not now, and the future is not yet?"

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Can a man be said to be conscious of time as past, present, and future? Who can be conscious of the nonexistent? And the existent is not time, it has no duration, there is no before and after in a mere limiting point. as of that which has been present. It cannot mean to him what memory certainly means to us; he cannot be conscious of a past, a present, and a future.

To extract the notion of time, of past, present, and future, from an experience which contains no element of succession, from an indivisible instant, is as hopeless a task as to extract a line from a mathematical point. It appears, then, that, if we are to be conscious of time at all, if we are to have the least conception of it, we must have some direct experience of change.

We cannot really be shut up to that punctual present, that mere point or limit between past and future, that the present has been described as being. But does this not imply that we can be directly conscious of what is not present, that we can now perceive what does not now exist? How is this possible? It is not easy for one whose reading has been somewhat limited in any given field to see the full significance of the problems which present themselves in that field. Those who read much in the history of modern philosophy will see that this ancient difficulty touching our consciousness of time has given rise to some exceedingly curious speculations, and some strange conclusions touching the nature of the mind.

It has been argued that, since the experience of each moment is something quite distinct from the experience of the next, a something that passes away to give place to its successor, we cannot explain the consciousness of time, of a whole in which successive moments are recognized as having their appropriate place, unless we assume a something that knows each moment and knits it, so to speak, to its successor. This something is the self or consciousness, which is independent of time, and does not exist in time, as do the various experiences that fill the successive moments. It is assumed to be timelessly present at all times, and thus to connect the nonexistent past with the existent present.

I do not ask the reader to try to make clear to himself how anything can be timelessly present at all times, for I do not believe that the words can be made to represent any clear thought whatever. Nor do I ask him to try to conceive how this timeless something can join past and present. I merely wish to point out that these modern speculations, which still influence the minds of many distinguished men, have their origin in a difficulty which suggested itself early in the history of reflective thought, and are by no means to be regarded as a gratuitous and useless exercise of the ingenuity. They are serious attempts to solve a real problem, though they may be unsuccessful ones, and they are worthy of attention even from those who incline to a different solution. **WHAT IS REAL TIME?**—From the thin air of such speculations as we have been discussing let us come back to the world of the plain man.

The world in which we all habitually live. It is from this that we must start out upon all our journeys, and it is good to come back to it from time to time to make sure of our bearings. We have seen that we distinguish between the real and the apparent, and that we recognize as the real world the objects revealed to the sense of touch. These objects stand to each other in certain relations of arrangement; that is to say, they exist in space. And just as we may distinguish between the object as it appears and the object as it is, so we may distinguish between apparent space and real space, between the relations of arrangement, actual and possible, which obtain among the parts of the object as it appears, and those which obtain among the parts of the object as it really is.

But our experience does not present us only with objects in space relations; it presents us with a succession of changes in those objects. And if we will reason about those changes as we have reasoned about space relations, many of our difficulties regarding the nature of time may, as it seems, be made to disappear. Thus we may recognize that we are directly conscious of duration, of succession, and may yet hold that this crude and immediate experience of duration is not what we mean by real time.

Every one distinguishes between apparent time and real time now and then. We all know that a sermon may seem long and not be long; that the ten years that we live over in a dream are not ten real years; that the swallowing of certain drugs may be followed by the illusion of the lapse of vast spaces of time, when really very little time has elapsed. What is this real time? It is nothing else than the order of the changes which take place or may take place in real things.

In the last chapter I spoke of space as the "form" of the real world; it would be better to call it a "form" of the real world, and to give the same name also to time. It is very clear that, when we inquire concerning the real time of any occurrence, or ask how long a series of such lasted, we always look for our answer to something that has happened in the external world.