The Notion of Sensible Appearance.—I have now tried to point out what is the irreducible minimum of properties which ordinary people consider must be possessed by anything if it is to count as a piece of Matter. I have also pointed out, by anticipation, that the history of philosophy shows there to be a great difficulty in holding that there are any entities which fulfil all these conditions in a literal sense. Lastly, we have noticed that the question of the reality or unreality of Matter, thus defined, is not perfectly clear-cut, because of the practical certainty that many of our terms will have to be interpreted in a more or less Pickwickian manner, and the doubt whether it is worth while to go on using familiar phrases after their literal meaning has been departed from beyond a certain point. We must now consider what facts make it hard to believe that anything obeys all four conditions in at all a literal sense.

The difficulty arises because of the group of facts which we sum up by saying that it is necessary to distinguish between things as they are and things as they seem to us, or between physical reality and sensible appearance. Difficulties always arise when two sets of properties apparently belong to the same object, and yet are apparently incompatible with each other. Now the difficulty here is to reconcile the supposed neutrality, persistence, and independence of a physical object with the obvious differences between its various sensible appearances to different observers at the same moment, and to the same observer at different moments between which it is held not to have undergone any physical change. We know, e.g., that when we lay a penny down on a table and view it from different positions it generally looks more or less elliptical in shape. The eccentricity of these various appearances varies as we move about, and so does the direction of their major axes. Now we hold that the penny, at which we say that we were looking all the time, has not changed; and that it is round, and not elliptical, in shape. This is, of course, only one example out of millions. It would be easy to offer much wilder ones; but it is simple and obvious, and involves no complications about a transmitting medium; so we will start with it as a typical case to discuss.

Now there is nothing in the mere ellipticity or the mere variation, taken by itself, to worry us. The difficulty arises because of the incompatibility between the apparent shapes and the supposed real shape, and between the change in the appearances and the supposed constancy of the physical object. We need not at present ask why we believe that there is a single physical object with these characteristics, which appears to us in all these different ways. It is a fact that we do believe it. It is an equally certain fact that the penny does look different as we move about. The difficulty is to reconcile the different appearances with the supposed constancy of the penny, and the ellipticity of most of the appearances with the supposed roundness of the penny. It is probable that at first sight the reader will not see much difficulty in this. He will be inclined to say that we can explain these various visual appearances by the laws of perspective, and so on. This is not a relevant answer. It is quite true that we can predict what particular appearance an object will present to an observer, when we know the
shape of the object and its position with respect to the observer. But this is not the question that is troubling us at present. Our question is as to the compatibility of these changing elliptical appearances, however they may be correlated with other facts in the world, with the supposed constancy and roundness of the physical object.

Now what I call Sensible Appearance is just a general name for such facts as I have been describing. It is important, here as always, to state the facts in a form to which everyone will agree, before attempting any particular analysis of them, with which it is certain that many people will violently disagree. The fundamental fact is that we constantly make such judgments as: "This seems to me elliptical, or red, or hot," as the case may be, and that about the truth of these judgments we do not feel the least doubt. We may, however, at the same time doubt or positively disbelieve that this is elliptical, or red, or hot. I may be perfectly certain at one and the same time that I have the peculiar experience expressed by the judgment: "This looks elliptical to me," and that in fact the object is not elliptical but is round.

I do not suppose that anyone, on reflection, will quarrel with this statement of fact. The next question is as to the right way to analyse such facts; and it is most important not to confuse the facts themselves with any particular theory as to how they ought to be analysed. We may start with a negative remark, which seems to me to be true, and is certainly of the utmost importance if it be true. Appearance is not merely mistaken judgement about physical objects. When I judge that a penny looks elliptical I am not mistakenly ascribing elliptical shape to what is in fact round. Sensible appearances may lead me to make a mistaken judgment about physical objects, but they need not, and, so far as we know, commonly do not. My certainty that the penny looks elliptical exists comfortably along-

side of my conviction that it is round. But a mistaken judgment that the penny is elliptical would not continue to exist after I knew that the penny was really round. The plain fact is then that "looking elliptical to me" stands for a peculiar experience, which, whatever the right analysis of it may be, is not just a mistaken judgment about the shape of the penny.

Appearance then cannot be described as mistaken judgment about the properties of some physical object. How are we to describe it, and can we analyse it? Two different types of theory seem to be possible, which I will call respectively the Multiple Relation Theory, and the Object Theory of sensible appearance. The Multiple Relation Theory takes the view that "appearing to be so and so" is a unique kind of relation between an object, a mind, and a characteristic. (This is a rough statement, but it will suffice for the present.) On this type of theory to say that the penny looks elliptical to me is to say that a unique and not further analysable relation of "appearing" holds between the penny, my mind, and the general characteristic of ellipticity. The essential point for us to notice at present about theories of this kind is that they do not imply that we are aware of anything that really is elliptical when we have the experience which we express by saying that the penny looks elliptical to us. Theories of this type have been suggested lately by Professor Dawes Hicks and by Dr G. E. Moore. So far, they have not been worked out in any great detail, but they undoubtedly deserve careful attention.

Theories of the Object type are quite different. They do not involve a unique and unanalysable multiple relation of "appearing," but a peculiar kind of object—an "appearance." Such objects, it is held, actually do have the characteristics which the physical object seems to have. Thus the Object Theory analyses the statement that the penny looks to me elliptical into a statement which involves the actual existence of an
elliptical object, which stands in a certain cognitive relation to me on the one hand, and in another relation, yet to be determined, to the round penny. This type of theory, though it has been much mixed up with irrelevant matter, and has never been clearly stated and worked out till our own day, is of respectable antiquity. The doctrine of "representative ideas" is the traditional and highly muddled form of it. It lies at the basis of such works as Russell's Lowell Lectures on the External World. In this book I shall deliberately confine myself to this type of theory, and shall try to state it clearly, and work it out in detail.

The following additional works may be consulted with advantage:

G. E. Moore, Philosophical Studies, V. and VII.

CHAPTER VIII

"Jack.—That, my dear Algy, is the whole truth, pure and simple.

"Algernon.—The truth is rarely pure and never simple. Modern life would be very tedious if it were either, and modern literature a complete impossibility." (Wilde, Importance of being Earnest.)

The Theory of Sensa, and the Critical Scientific Theory

I propose now to state more fully the theory that appearances are a peculiar kind of objects, and to consider what sort of objects they must be. The reader will bear in mind throughout the whole of the long story which follows that there is a totally different view of sensible appearance, viz., the Multiple Relation Theory, and that this may quite possibly be true, in this book I shall leave it wholly aside. On the theory that we are now going to discuss, whenever a penny looks to me elliptical, what really happens is that I am aware of an object which is, in fact elliptical. This object is connected in some specially intimate way with the round physical penny, and for this reason is called an appearance of the penny. It really is elliptical, and for this reason the penny is said to look elliptical. We may generalise this theory of sensible appearance as follows: Whenever I truly judge that x appears to me to have the sensible quality q, what happens is that I am directly aware of a certain object y, which (a) really does have the quality q, and (b) stands in some peculiarly intimate relation, yet to be determined, to x. (At the present stage, for all that we know, y might sometimes be identical with x, or
might be literally a part of $x$.) Such objects as $y$ I am going to call *Sensa*. Thus, when I look at a penny from the side, what happens, on the present theory, is at least this: I have a sensation, whose object is an elliptical, brown sensum; and this sensum is related in some specially intimate way to a certain round physical object, viz., the penny.

Now I think it must at least be admitted that the sensum theory is highly plausible. When I look at a penny from the side I am certainly aware of something', and it is certainly plausible to hold that this something is elliptical in the same plain sense in which a suitably bent piece of wire, looked at from straight above, is elliptical. If, in fact, nothing elliptical is before my mind, it is very hard to understand why the penny should seem elliptical rather than of any other shape. I do not now regard this argument as absolutely conclusive, because I am inclined to think that the Multiple Relation theory can explain these facts also. But it is at least a good enough argument to make the sensum theory well worth further consideration.

Assuming that when I look at a penny from the side I am directly aware of something which is in fact elliptical, it is clear that this something cannot be identified with the penny, if the latter really has the characteristics that it is commonly supposed to have. The penny is supposed to be round, whilst the sensum is elliptical. Again, the penny is supposed to keep the same shape and size as we move about, whilst the sensa alter in shape and size. Now one and the same thing cannot, at the same time and in the same sense, be round and elliptical. Nor can one and the same thing at once change its shape and keep its shape unaltered, if "shape" be used in the same sense in both statements. Thus it is certain that, if there be sensa, they cannot in general be identified with the physical objects of which they are the appearances, if these literally have the properties commonly assigned to them. On the other hand, all that I ever come to know about physical objects and their qualities seems to be based upon the qualities of the sensa that I become aware of in sense-perception. If the visual sensa were not elliptical and did not vary in certain ways as I move about, I should not judge that I was seeing a round penny.

The distinction between sensum and physical object can perhaps be made still clearer by taking some wilder examples. Consider, e.g., the case of looking at a stick which is half in water and half in air. We say that it looks bent. And we certainly do not mean by this that we mistakenly judge it to be bent; we generally make no such mistake. We are aware of an object which is very much like what we should be aware of if we were looking at a stick with a physical kink in it, immersed wholly in air. The most obvious analysis of the facts is that, when we judge that a straight stick looks bent, we are aware of an object which really is bent, and which is related in a peculiarly intimate way to the physically straight stick. The relation cannot be that of identity; since the same thing cannot at once be bent and straight, in the same sense of these words. If there be nothing with a kink in it before our minds at the moment, why should we think then of kinks at all, as we do when we say that the stick looks bent? No doubt we can quite well mistakenly believe a property to be present which is really absent, when we are dealing with something that is only known to us indirectly, like Julius Caesar or the North Pole. But in our example we are dealing with a concrete visible object, which is bodily present to our senses; and it is very hard to understand how we could seem to ourselves to see the property of bentness exhibited in a concrete instance, if in fact nothing was present to our minds that possessed that property.

As I want to make the grounds for the sensum theory as clear as possible, I will take one more example. Scientists often assert that physical objects are not
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"really" red or hot. We are not at present concerned with the truth or falsehood of this strange opinion, but only with its application to our present problem. Let us suppose then, for the sake of argument, that it is true. When a scientist looks at a penny stamp or burns his mouth with a potato he has exactly the same sort of experience as men of baser clay, who know nothing of the scientific theories of light and heat. The visual experience seems to be adequately described by saying that each of them is aware of a red patch of approximately square shape. If such patches be not in fact red, and if people be not in fact aware of such patches, where could the notion of red or of any other colour have come from? The scientific theory of colour would have nothing to explain, unless people really are aware of patches under various circumstances which really do have different colours. The scientists would be in the position of Mr Munro's duchess, who congratulated herself that unbelief had become impossible, as the Liberal Theologians had left us nothing to disbelieve in. Thus we seem forced to the view that there are at least hot and coloured sensa; and, if we accept the scientific view that physical objects are neither hot nor coloured, it will follow that sensa cannot be identified with physical objects.

The reader may be inclined to say, "After all, these sensa are not real; they are mere appearances, so why trouble about them?" The answer is that you do not get rid of anything by labelling it "appearance." Appearances are as real in their own way as anything else. If an appearance were nothing at all, nothing would appear, and if nothing appeared, there would be nothing for scientific theories to account for. To put the matter in another way: Words like real and reality are ambiguous. A round penny and an elliptical visual sensum are not real in precisely the same sense. But both are real in the most general sense that a complete inventory of the universe must mention the one as much as the other. No doubt the kind of reality which is to be ascribed to appearances will vary with the particular type of theory as to the nature of sensible appearance that we adopt. On the present theory an appearance is a sensum, and a sensum is a particular existent, though it may be a short-lived one. On the Multiple Relation theory appearances have a very different type of reality. But all possible theories have to admit the reality, in some sense, of appearances; and therefore it is no objection to any particular theory that it ascribes a sort of reality to appearances.

I hope that I have now made fairly clear the grounds on which the sensum theory of sensible appearance has been put forward. Closely connected with it is a theory about the perception of physical objects, and we may sum up the whole view under discussion as follows: Under certain conditions I have states of mind called sensations. These sensations have objects, which are always concrete particular existents, like coloured or hot patches, noises, smells, etc. Such objects are called sensa. Sensa have properties, such as shape, size, hardness, colour, loudness, coldness, and so on. The existence of such sensa, and their presence to our minds in sensation, lead us to judge that a physical object exists and is present to our senses. To this physical object we ascribe various properties. These properties are not in general identical with those of the sensum which is before our minds at the moment. For instance, the elliptical sensum makes us believe in the existence of a round physical penny. Nevertheless, all the properties that we do ascribe to physical objects are based upon and correlated with the properties that actually characterise our sensa. The sensa that are connected with a physical object x in a certain specially intimate way are called the appearances of that object to those observers who sense these sensa. The properties which x is said to appear to have are the properties which those sensa that are
x's appearances really do have. Of course, the two properties may happen to be the same, e.g., when I look straight down on a penny, both the physical object and the visual appearance are round. Generally, however, there is only a correlation between the two.

It follows from this theory that sensa cannot appear to have properties which they do not really have, though there is no reason why they should not have more properties than we do or can notice in them. This point perhaps needs a little more elaboration, since a good deal of nonsense has been talked by opponents of the sensum theory in this connexion. We must distinguish between failing to notice what is present in an object and "noticing" what is not present in an object. The former presents no special difficulty. There may well be in any object much which is too minute and obscure for us to recognise distinctly. Again, it is obvious that we may sense an object without necessarily being aware of all its relations even to another object that we sense at the same time. Still more certain is it that we may sense an object without being aware of all its relations to some other object which we are not sensing at the time. Consequently, there is no difficulty whatever in supposing that sensa may be much more differentiated than we think them to be, and that two sensa may really differ in quality when we think that they are exactly alike. Arguments such as Stumpfs render it practically certain that the latter possibility is in fact realised.

The real difficulty is when we seem to be directly aware of some property in an object, and this property is not really present and is perhaps incompatible with others which are present. This is the kind of difficulty that the sensum theory is put forward to meet. We seem to recognise elliptical shape in the penny, when the penny really has the incompatible quality of roundness. The solution which the sensum theory offers is to "change the subject." Something, it admits, is elliptical, and something is round; but they are not the same something. What is round is the penny, what is elliptical is the sensum. Now, clearly, this would be no solution, if the same sort of difficulty were to break out in sensa themselves. In that case we should need to postulate appearances of appearances, and so on indefinitely.

We must hold, as regards positive sensible qualities which characterise a sensum as a whole and do not involve relations to other sensa, that a sensum is at least all that it appears to be. Now, so far as I know, there is no evidence to the contrary. Some people have thought that arguments like Stumpfs raised this difficulty; but that is simply a mistake. Stumpfs argument deals merely with the relation of qualitative likeness and difference between different sensa, and shows that we may think that two of them are exactly alike when there is really a slight qualitative or quantitative difference between them. This has no tendency to prove that we ever find a positive non-relational quality in a sensum, which is not really there.

Next, we must remember that attributes which involve a negative factor often have positive names. A man might quite well think, on inspecting one of his sensa, that it was exactly round and uniformly red. And he might well be mistaken. But then, "exactly round" means "with no variation of curvature," and "uniformly red" means "with no variation of shade from one part to another." Now universal negative judgments like these can never be guaranteed by mere inspection; and so, in such cases, the man is not "seeing properties that are not there" in the sense in which he would be doing so if a round sensum appeared to him to be elliptical. To sum up, it is no objection to the sensum theory that a sensum may seem to be less differentiated than it is; it would be a fatal objection if a sensum ever seemed more differentiated than it is; but we have no evidence that the latter ever happens.
Before going further we must remove a baseless prejudice which is sometimes felt against the sensum theory. It is often objected that we are not aware of sensa and their properties, as a rule, unless we specially look for them. It is a fact that it often needs a good deal of persuasion to make a man believe that, when he looks at a penny from the side, it seems elliptical to him. And I am afraid that very often, when he is persuaded, it is not by his own direct inspection (which is the only relevant evidence in such a matter), but by some absurd and irrelevant argument that the area of his retina affected by the light from the penny, is an oblique projection of a circle, and is therefore an ellipse. Accordingly, it is argued that we have no right to believe that such a man is directly sensing an object which is, in fact, elliptical. To this objection a partial answer has already been given, by implication. It is only when we are looking at a penny almost normally that any doubt is felt of the ellipticity of the sensum; and, in that case, the sensum is, in fact, very nearly round. Now we have seen that it is no objection to our theory that a sensum which is not quite round should be thought to be exactly round, though it would be an objection if an exactly round sensum seemed to be elliptical. The reason, of course, is that an ellipse, with its variable curvature, is a more differentiated figure than a circle, with its uniform curvature. There is no difficulty in the fact that we overlook minute differentiations that are really present in our sensa; difficulties would only arise if we seemed to notice distinctions that are not really present.

Apart, however, from this special answer, a more general reply can be made to the type of objection under discussion. The whole argument rests on a misunderstanding of the view about perception which the sensum theory holds. If the theory were that, in perceiving a penny, a man first becomes aware of a sensum, then notices that it is elliptical, and then infers from this fact and the laws of perspective that he is looking at a round physical object, the argument would be fatal to the theory. But this is quite obviously not what happens. Perceptual judgments are indeed based upon sensa and their properties to this extent, that if we were not aware of a sensum we should not now judge that any physical object is present to our senses, and that if this sensum had different properties we should ascribe different properties to the physical object. But the relation between the sensum and its properties, on the one hand, and the perceptual judgment about the physical object, on the other, is not that of inference. The best analogy that we can offer to the relation between our sensing of a sensum and our perceiving a physical object, is to be found in the case of reading a book in a familiar language. What interests us as a rule is the meaning of the printed words, and not the peculiarities of the print. We do not explicitly notice the latter, unless there be something markedly wrong with it, such as a letter upside down. Nevertheless, if there were no print we should cognise no meaning, and if the print were different in certain specific ways we should cognise a different meaning. We can attend to the print itself if we choose, as in proof-reading. In exactly the same way, we are not as a rule interested in sensa, as such, but only in what we think they can tell us about physical objects, which alone can help or hurt us. Sensa themselves "cut no ice." We therefore pass automatically from the sensum and its properties to judgments about the physical object and its properties. If it should happen that the sensum is queer, as when we see double, we notice the sensum, as we notice an inverted letter. And, even in normal cases, we generally can detect the properties of sensa, and contrast them with those which they are leading us to ascribe to the physical object, provided that we make a special effort of attention.

From what has just been said, it will not appear
strange that, even though there be sensa, they should have been overlooked by most plain men and by many philosophers. Of course, everyone is constantly sensing them, and, in specially abnormal cases, has noted the difference between them and physical objects. But sensa have never been objects of special interest, and therefore have never been given a name in common speech. A result of this is that all words like "seeing," "hearing," etc., are ambiguous. They stand sometimes for acts of sensing, whose objects are of course sensa, and sometimes for acts of perceiving, whose objects are supposed to be bits of matter and their sensible qualities. This is especially clear about hearing. We talk of "hearing a noise" and of "hearing a bell." In the first case we mean that we are sensing an auditory sensum, with certain attributes of pitch, loudness, quality, etc. In the second case we mean that, in consequence of sensing such a sensum, we judge that a certain physical object exists and is present to our senses. Here the word "hearing" stands for an act of perceiving. Exactly the same remarks apply to sight. In one sense we see a penny; in a somewhat stricter sense we see only one side of the penny; in another sense we see only a brown elliptical sensum. The first two uses refer to acts of perceiving, the last to an act of sensing. It is best on the whole to confine words like "seeing" and "hearing" to acts of perceiving. This is, of course, their ordinary use. I shall therefore talk of seeing a penny, but not of seeing a brown elliptical sensum. I shall speak of the latter kind of cognition as "visually sensing," or merely as "sensing," when no misunderstanding is to be feared by dropping the adjective. This distinction will be found important when we come to deal with illusory perceptions.

I have now tried to clear up certain ambiguities in the sensum theory, and to remove certain mistaken objections which many folk feel against it. If it be admitted that there may be such things as sensa, and that the sensum theory at least provides a possible and even plausible way of analysing sensible appearance, we can pass to the question of the nature of sensa and their status in the universe. This splits into two questions, viz., (i) the relation of sensa to minds; and (ii) their relation to physical objects. Neither of these can be completely answered at the present stage, but we can say a good deal here that is relevant, and will be useful, about them.

(i) Are Sensa in any way Mental?—Sensa have been supposed by many philosophers to be in some way mental. This opinion is based partly on sheer verbal confusions, and partly on genuine facts. The verbal confusion is that the word "sensation" has often been used ambiguously, and that, in one of its meanings, it does undoubtedly stand for something that is mental. When a man talks of a "sensation of red," he is sometimes referring to a red patch which he senses, sometimes to his act of sensing the patch, and sometimes to the whole complex state of affairs which, on the sensum theory, is analysable into (act of sensing)—directed on to—(red patch). In the second meaning, "sensation" is obviously mental; in the third it is undoubtedly a complex whole which involves a mental factor. In the first meaning it is by no means obvious or even plausible to say that a sensation is mental. I shall always use "sensation" in the third meaning. Now, as the same name is thus often used, both for the patch and for something which undoubtedly is mental, or is a complex, involving a mental factor, it is not surprising that some people should have been inclined to think that the red patch is itself mental. For is it not a "sensation"? And is not a sensation a mental state? This is, of course, mere verbal confusion, and need not trouble us further. But philosophers who have not fallen into this confusion between sensum, sensation, and act of
sensing, have yet held that sensa are mental. The most important living holder of this view is Professor Stout (at any rate he held it at the time when he wrote the last edition of his Manual of Psychology).

Before we can profitably carry the discussion of this point further, we must clear up the various meanings which can be attached to the statement "x is mental." (i) The first distinction that we must draw is between being "a state of mind" and being "mind-dependent." It is commonly held (and I do not here propose to question it) that whatever is a state of mind is mind-dependent, i.e., that it could not exist except as a constituent of a mind, and, in fact, that it could only exist as a constituent of that particular mind, whose state it is said to be. An example would be my belief that $2 + 2 = 4$ or my desire for my tea. But it seems perfectly possible that a term might be mind-dependent without being a state of anyone's mind. What would this mean? I think it would mean that such a term can only exist as a constituent of a state of mind, but that it is not itself a constituent of a mind. Take some admitted state of mind, such as my perception of my table. There is clearly an important sense which we can all recognise, even though none of us can define it, in which it is true to say that this perception is a constituent of my mind, whilst the table is not. I should say that there was also an important (though very different) sense in which it is true to say that the table is a constituent of my perception of it, so long as that perception lasts. It is thus quite common for a term to become a constituent of one of my states of mind without being a constituent (and therefore without being a state) of my mind. Now, if chairs are anything like what they are commonly supposed to be, they do not only exist as constituents of states of mind, since it is commonly believed that such things go on existing with little or no change of quality when we cease to perceive them. But, just as states of mind can only exist as constituents of minds, so there might be terms which can only exist as constituents of states of mind. Such terms would be mind-dependent without being states of mind. If Berkeley's famous saying that "the essence of a sensible object is to be perceived" be taken quite literally, it implies that such objects are mind-dependent, whilst it does not imply (though it is, of course, consistent with) the view that they are states of mind.

(2) Even when this distinction has been drawn, there is a possibility of confusion. We must distinguish a more and a less radical sense of "mind-dependence." The sense just discussed is the more radical, and may be termed "existential mind-dependence." A term that is existentially mind-dependent, though not a state of mind, can only exist as a constituent of a certain state of mind. But a term which was not existentially mind-dependent, might be to a certain extent "qualitatively mind-dependent." By this I mean that, although it can exist and have qualities when it is not a constituent of any state of mind, it might acquire some new qualities or alter some of its old qualities on becoming a constituent of a state of mind. It is certain that everything that at some period in its history becomes a constituent of any state of mind thereby acquires at least one new quality, viz., that it is now cognised, or desired, or shunned, or so on, by that mind. And I do not see any reason in principle why these changes of relation should not produce changes in the non-relational qualities of the object. If wax melts when brought into the relation of proximity to a fire, I know no reason why some qualities of an object should not be added or modified when it comes into the relation of being sensed by a mind.

(3) Some psychologists, of whom Stout is one, draw a fundamental distinction between two sorts of states of mind. They divide them into acts and non-acts. And a state of mind which is not an act they call a _presentation_.

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**SCIENTIFIC THOUGHT**

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I propose to state this distinction in a different way, for reasons which I will now explain. A little while ago I took my perception of my table as an undoubted example of a state of mind. And I said that there was no doubt that the table is a constituent of it. That is, I took the whole complex situation (my perceiving)—of—I take it as a state of mind. What Stout calls an "act" is "my perceiving." He calls this a "state of mind," I call it a "constituent of a state of mind." The table is not a constituent of the state of mind, in Stout's sense of the word, whilst it is a constituent of the state of mind, in my sense of the word. In my terminology the act may be described as the non-objective constituent in a state of mind whose other constituent is its object. An act is something which cannot exist by itself, but can only exist as a constituent in a complex, whose other constituent is its object. And it is, of course, the characteristically mental factor in such a complex, since the other constituent may (though it need not) be non-mental. My reason for calling the whole complex fact, and not the act itself, a state of mind, is the following: Practically everyone agrees that there are such things as states of mind. And practically everyone agrees that the phrase "my perception of the table" describes something real. But people differ greatly as to the right analysis of this fact, and the notion of "act" is connected with one special mode of analysis which would not be accepted by everyone. It therefore seems better to give the name "state of mind" to the fact which everyone admits to exist, and not to a supposed constituent, which some people deny to be present in it.

It is quite easy to restate the distinction which Stout has in mind in terms of my phraseology. Some mental states can be analysed into an act directed on an object. These are non-presentational states of mind. Others cannot be analysed into act and object. These are presentations. A non-presentational state may contain a presentation as object. For instance, a feeling of toothache would be a presentation on Stout's view. For, according to him, it is mental and is not analysable into an act of sensing and a "toothachy" object; it is just a "toothachy" state of mind. Now, if I were to introspect my toothache, in order to describe it to my dentist, my introspection would be a non-presentational mental state whose object is a presentation; for it is a complex containing an act of introspecting directed on to a toothachy feeling. The perception of a chair would be an example of a non-presentational mental state, whose object is not a presentation, because not mental.

We are now in a better position to deal with the question: "Are sensa mental?" This might mean (1) Are they acts? (2) Are they states of mind analysable into act and object? (3) Are they presentations? (4) Are they existentially mind-dependent, though not states of mind? (5) Are they to some extent qualitatively mind-dependent, though not existentially mind-dependent?

No one has ever suggested that sensa are acts or that they are states of mind analysable into act and object. A red patch sensed by me when I look at a pillar-box is an example of a sensum. It is plausible to hold that the whole fact known as "my sensation of the red patch" is a state of mind, analysable into act of sensing and red patch sensed. But there would be no plausibility in holding that the red patch itself was an act, or that it was itself divisible into act and object. Thus, if sensa be states of mind at all, they must be presentations. Now, there are two very different views included under the statement that sensa are presentations. The first would deny the analysis of "my sensation of red patch" into act of sensing and red sensum. It would treat the whole thing as an unanalysable state of mind, and therefore as a presentation. This view would hold that there is no real distinction between sensa and sensations. It would say that "sensation of red patch," "red patch sensed," and
is a presentation.* The second view would admit that in my sensation of red we can distinguish my act of sensing and the red patch sensed; but it would hold that the red patch is itself a state of mind, and, being indivisible into act and object, is a presentation. I do not think that most philosophers have very clearly distinguished these two varieties of the presentational theory of sensa. Moreover, those philosophers who have accepted the analysis of sensations into acts of sensing and sensa, and have asserted that sensa are mental, have seldom clearly distinguished the alternatives that sensa are presentations and that sensa are mind-dependent without being states of mind. And lastly, the distinction between existential and qualitative mind-dependence has not always been clearly seen. So that there is a very pretty mess for us to wipe up as well as we can.

(i) Are Sensations analysable into Act of Sensing and Sensum? The most plausible argument against this analysis would seem to be the following: If we consider the various experiences called "sensations," we seem to be able to arrange them in an order, starting with those of sight, passing through those of taste and smell, and ending with bodily sensations, like headache. Now, as regards the top members of the series, the analysis into act of sensing and object sensed seems pretty clear. A sensation of red seems clearly to mean a state of mind with a red object, and not to mean a red state of mind.

If we now pass to the other end of the series the opposite seems to be true. It is by no means obvious that a sensation of headache involves an act of sensing and a "headachy" object; on the contrary, it seems on the whole more plausible to describe the whole experience as a "headachy" state of mind. In fact the distinction of act and object seems here to have vanished; and, as there is clearly something mental in feeling a headache, just as there is in sensing a red patch, it seems plausible to hold that a sensation of headache is an unanalysable mental fact, within which no distinction of act and object can be found.

Now this contrast between the top and the bottom members of the series would not greatly matter, were it not for the fact that the two kinds of sensation seem to melt insensibly into each other at the middle of the series. It is about equally plausible to analyse a sensation of a sweet taste into an act of sensing and a sweet sensum, or to treat it as an unanalysable mental fact, having no object, but possessing the property of sweetness. Common speech recognises these distinctions. We talk of a sensation of red, but never of a feeling of red or of a red feeling. On the other hand, we talk indifferently of a sensation of headache, a feeling of headache, a headachy sensation, and a headachy feeling. The English talk of a sensation of smell, whereas the Scots more usually speak of "feeling" a smell. Now sensations of smell are just on the borderline between the two kinds of sensation. The rule is that, when a sensuous experience seems clearly to involve act and object, it is called a sensation and never a feeling; when it is doubtful whether any such analysis can be applied, it is called indifferently a feeling or a sensation.

Now the fact that all these experiences are classed together as sensations, and that the two kinds melt into each other at the middle of the series, naturally tempts men to treat them all alike. If we do this, we must hold either (a) that it is a mistake to think that a sensation of red can be analysed into an act of sensing and a red sensum; or (b) that it is a mistake to think that a sensation of headache cannot be analysed into an act of sensing and a headachy sensum. The former alternative makes sensation and sensum fall together into a single peculiar state, even in the case of sight;

* This seems to be Stout's view in the Manual of Psychology, but I may be misinterpreting him.
and, since the experience as a whole certainly is mental, we have to say that a sensation of red = a red sensum = a feeling or presentation which is red. The second alternative is that which is taken by Realists, like Professors Laird and Alexander.

Now it is evident that, if you insist on treating all experiences which are called "sensations" in the same way, it is antecedently as reasonable to take the Laird-Alexander alternative as the Presentationist alternative. You might argue: "It is obvious that a sensation of red involves an act of sensing and a red sensum, so a sensation of headache must involve an act of sensing and a headachy sensum." Thus the mere fact that sensations can be arranged in a series, such as I have described, does not specially favour the presentationist view; since exactly the same type of argument, starting from the other end of the series, would lead to exactly the opposite conclusion. There are just two remarks that seem to me worth making at this point.

(a) I do not find either the realist or the presentationist view very satisfactory as a complete account of all the experiences which are called "sensations." But, if I were forced to take one alternative or the other, I should prefer the former. It seems to me much more certain that, in a sensation of red, I can distinguish the red patch and the act of sensing it, than that, in a sensation of headache, I cannot distinguish a headachy object and an act of sensing it. (b) I think, however, that there is no need to insist on the realist analysis of bodily feelings in order to deal with the question whether sensations be analysable into act of sensing and sensum. It seems to me that the simplest and least doubtful way of treating the whole question raised by the series of sensations is the following: The word "sensation," as commonly used, is defined, not by direct inspection, but by causation. We say that we are having a sensation, if our state of mind is the immediate response to the stimulation of a nerve. Now, since sensations are not defined psychologically through their intrinsic properties, but psychologically through their bodily antecedents, it is surely very likely that they may include two very different kinds of experience, one of which can and the other cannot be analysed into act of sensing and sensum. These might be called respectively "true sensations" and "bodily feelings." The mere fact that both are often called "sensations" is surely a very poor reason for insisting that the structure of both must be the same. It is true indeed that there are marginal cases of which it is very difficult to say into which class they fall. But this ought not to make us slur over the plain introspective difference between the top and the bottom members of the series. The top ones at least do seem quite clearly to involve acts of sensing and sensa on which these acts are directed. It does seem clear that, when I have a sensation of a red triangular patch, some things are true of the patch itself (e.g., that it is red and triangular) which it is very difficult to believe to be true of my sensation of the red patch. If so, it seems necessary to hold that the sensation and the sensum are not identical; that the sensum is an objective constituent of the sensation; and that there is another constituent which is not objective and may be called "the act of sensing." Into the question whether this latter factor is capable of further analysis, and, if so, what the right analysis of it may be, it is fortunately not necessary to go for our present purposes.

I conclude, then, that some sensations at least are analysable into act of sensing and sensum, and therefore that we cannot argue that sensum = sensation = a presentation.

(2) Are Sensa, though distinct from Sensations, themselves Presentations? Though sensations are not presentations but contain objects, which are sensa, it is perfectly possible that these objects might themselves be presentations. To prove that sensa are presentations, it would be necessary to prove that they are states of
mind. And this involves proving (a) that they are existentially mind-dependent, and (b) that they are constituents of minds and not merely of certain states of mind. Obviously it might be possible to prove the first, even if it were not possible to prove the second, of these propositions. I do not know of any reasonably plausible argument to prove that sensa are not merely mind-dependent, but are also states of mind, once you accept the view that sensa must be distinguished from sensations. Indeed, the assertion would be open to the same kind of objection which we made to the view that sensations are not merely mind-dependent, but are also states of mind, once you accept the view that sensations must be distinguished from sensations. On either view something is said to be a state of mind, though it possesses properties which it is very difficult to ascribe to states of mind. If a sensum be a state of mind, then there are states of mind which are literally red or round or hot or loud or triangular, and so on. I have no difficulty in believing that many states of mind contain such terms as objects, but I do find it very difficult to believe that any state of mind actually is a term of this sort. Yet the latter is implied by the statement that sensa are presentations, just as much as by the statement that sensations are presentations. In fact, the reasons which forced us to distinguish sensations from sensa, and to regard the latter as objects contained in the former, equally forbid us to treat sensa themselves as states of mind. This objection may, of course, be a mere prejudice; but it is worth while to point out that the view that sensa are presentations does logically imply the very paradoxical propositions that some states of mind are literally hot or red or round, for most philosophers who have held the view under discussion have successfully concealed this consequence from themselves and their readers. I shall therefore reject the view that sensa are states of mind, until someone produces much better reasons than anyone has yet done for believing such an extremely paradoxical proposition. There are, however, quite plausible arguments to prove that sensa are existentially mind dependent, though not states of mind. That is to say, that, although sensations are analysable into act and sensum, and the sensum must therefore be distinguished both from the sensation and from the act of sensing, which is the other factor in the sensation, yet these two factors are not capable of existing separately from each other. No act of sensing without some sensum on which it is directed, and no sensum without an act of sensing directed upon it. The arguments for this view are three: (a) The privacy and variability of sensa; (b) the analogy between sensa and bodily feelings; and (c) the analogy between sensa and so-called "mental images."

(a) We notice at once that sensa have some of the characteristics of physical objects and some of those of mental states. On the one hand, they are extended, and have shapes, sizes, colours, temperatures, etc. On the other hand, they do seem to be private to each observer; and this, it will be remembered, is one of the chief marks of the mental as distinct from the physical. It is at least doubtful whether two people, who say that they are perceiving the same object, are ever sensing the same sensum or even two precisely similar sensa. This does suggest that sensa are mental—at any rate in the sense of being mind-dependent.

If, however, we look more closely, we see that this conclusion does not necessarily follow. The facts are on the whole much better explained by supposing that the sensa which a man senses are partly dependent on the position, internal states, and structure of his body. Since no two men's bodies can be in precisely the same place at precisely the same time, it is not surprising that the sensa of the two men should differ. And, since the internal states and the minute structure of no two living bodies are exactly alike, it is still less surprising. Now this explanation not only accounts as well for most of the facts as the view that sensa are mind-dependent; it accounts a great deal better for some of the most striking
of the facts. The orderly variation in the shapes of visual sensa, as we move about, is intelligible if we suppose that the sensa which we sense are partly conditioned by the positions of our bodies. The assumption that they depend on our minds gives no explanation whatever of such facts.

There is, however, a better form of this argument, which has, I think, been somewhat neglected by people who want to hold that sensa are never mind-dependent to any degree. It does seem to me undeniable that in certain cases, and to a certain extent, our past experiences and our present expectations affect the actual properties of the sensa that we sense, and do not merely affect the judgments about physical objects which we base upon sensa. We shall go into this point in some detail in a later chapter; at present I will just illustrate my meaning by two examples.

When I look at the "staircase figure," which is given in most psychology text-books as an instance of ambiguous figures, it seems to me that it actually looks sensibly different from time to time. Its sensible appearance changes "with a click," as I look at it, from that of a staircase to that of an overhanging cornice. This change tends to take place as I concentrate my mind on the idea of the one or on that of the other. Now, on the present analysis of sensible appearance, such a change as this involves an actual qualitative change in the sensum. So far is it from being a mere change in the judgments which I happen to base on one and the same sensum, that the direction of my thoughts changes first and is the condition of the change in the sensible appearance.

Again, when I turn my head, the visual sensa are not as a rule affected with any sensible movement. If, however, I put my glasses a little out of focus or look through a window made of irregularly thick glass, and then turn my head, the sensa do sensibly move. Whether they move or keep still seems to depend on my past experiences and my present expectations about physical objects. The whole psychology of vision is full of such cases, some of them of a highly complex kind.

Now, of course, these examples do not suggest for a moment that sensa are existentially mind-dependent, but they do strongly suggest that they are to some extent qualitatively mind-dependent. And it cannot be said here, as in the previous examples, that reference to the mind gives no help in explaining the facts. Here the boot is rather on the other foot. No doubt the facts just mentioned could in theory be accounted for by referring to the past history of the body, in addition to its present state and position. I.e., we could talk learnedly about the traces left on our brains and nervous systems by the past experiences, and could say that they are among the conditions of our sensa. But this would not help us to explain any concrete characteristic of our sensa in any particular case. For the plain fact is, that we do often know what relevant experiences we or others have had, whilst we know nothing whatever in detail about traces in the brain and nervous system. So here a reference to mental conditions really does explain concrete facts, whilst a reference to bodily conditions does not. We shall have to return to this point at a much later stage.

(b) We have already noticed the arrangement of "sensations" in a scale from sensations of colour and sound to bodily feelings. We saw that this might be used as an argument to prove that even sensations of colour and sound are presentations, or equally as an argument to prove that even sensations of headache are divisible into act and object. Suppose we take the latter alternative, which, as I have said, seems to me to be the more plausible of the two, though I do not think that the facts compel us to adopt either. It is then possible to produce a fairly plausible argument for the view that sensa are existentially mind-dependent.
The argument would run as follows: "Granted that a sensation of headache can be analysed into act of sensing and headachy sensum, it is surely obvious that the latter, from its very nature, could not exist without the former. An unfelt headache is surely a mere Unding. Now, if this be true of headachy sensa, does it not involve the very continuity of the series of sensations on which you have been insisting make it likely to be true of red sensa, and indeed of all sensa? If so, sensa will be from their very nature existentially mind-dependent and incapable of existing save as objective constituents of sensations."

I think that this is quite a plausible argument, but I do not think it conclusive. Two questions could be asked about it. (α) Supposing it to be true that an unfelt headache is inconceivable, does the continuity of the series of experiences called "sensations," justify us in extending this conclusion to all sensa, and, in particular, to those of sight and hearing? Secondly (β), is it really true that an unfelt headache is inconceivable? (α) To the first question I answer that, as a matter of fact, I do not find the slightest intrinsic difficulty in conceiving the existence of unsensed red patches or unsensed noises, whilst I do find a considerable difficulty in conceiving the existence of unfelt headaches. I do not think that it is safe to reject this plain difference on the grounds of a mere argument from continuity.

(β) Moreover, I think I can see why it seems so difficult to conceive of the existence of unfelt headaches, and can see that this difficulty is not really conclusive. Our main interest in bodily feelings is that they are pleasant or painful; sensations of sight are, as a rule, intrinsically neutral, or nearly so. Now I am quite prepared to believe that an object has to be cognised by us in order to be pleasant or painful to us. For it seems to me that the pleasantness or painfulness of anything is (or, at any rate, depends upon) my recognising it and taking up a certain attitude of liking or disliking to it. It might, therefore, be perfectly true that in unfelt headache would not be a pain, just as an unmarried woman is not a wife. Since we are mainly interested in headaches as pains, we are inclined to think that an unfelt headache would be nothing, when the truth merely is that it would not be a pain. This would be comparable to the mistake which a fanatical admirer of matrimony would make if he ignored the existence of all spinster because they were not wives. I, therefore, am not convinced that, if a feeling of headache be a genuine sensation and not a mere presentation, the headachy sensum which it contains could not exist unsensed. Still less could I extend this view to sight and sound sensa.

(c) The third argument for thinking that sensa are incapable of existing unsensed is founded on their resemblance to "mental images," whose very name implies that they are commonly supposed to be existentially mind-dependent, if not actually states of mind. The resemblances must be admitted, though in favourable cases there seems to be some intrinsic difference which it is easy to recognise but hard to describe. But it seems to me doubtful whether images are existentially mind-dependent. I do not see any very obvious reason why there should not be "unimaged" images. It is, of course, perfectly true that images are to a much greater extent qualitatively mind-dependent than are sensa. Most, if not all, of them depend on our past experiences; and many of them depend in part on our present volitions. Voluntary images do, no doubt, depend on our minds, in the sense that they would not be imaged here and now, if we did not will them. But exactly the same is true of many things, which no one would think of calling existentially mind-dependent. Most chemical reactions that take place in a laboratory would never have happened if someone had not deliberately mixed the reagents in a flask and heated the latter over a flame. No one supposes that this renders
such reactions in any important sense mind-dependent. Thus the fact that some images are voluntary seems irrelevant to the present subject.

The other point, that all images that we can now image are in part determined in their characteristics by our past experiences, is more important. It must be counted along with the fact, already admitted, that many sensa are to some extent qualitatively mind-dependent. Here, as before, we can, if we like, substitute a reference to traces in our brains and nervous systems. But here, too, the doubt remains whether this kind of explanation is ultimately of much philosophic importance, in view of the fact that we often know directly what our relevant past experiences are, whilst the traces, etc., of the physiologist are purely hypothetical bodily correlates of these. Further treatment of this subject must be deferred till we face the problem of the part played by our own bodies in sensation and imagination.

I will now try to sum up the results of this rather long and complex discussion on the relation of sensa to minds and their states. The sensum theory is bound up with a special view as to the right analysis of the kind of fact which is described by such phrases as "my sensation of x." It holds that this is complex, and that within it there can be distinguished two factors — x itself, which is the sensum and is an object, and a subjective factor, which is called the "act of sensing." The latter may, of course, be capable of further analysis, such, e.g., as Russell attempts in his *Analysis of Mind*; or it may be (or contain) a peculiar unanalysable relation. Now, there is also a theory which refuses to analyse "my sensation of x" in this way. It holds that the whole thing is unanalysable into act and object. On such a view the distinction between sensum and sensation vanishes; and the experience, which may be called indifferently by either name, is a mental state of the kind called presentations. This view is supported by reference to bodily feelings, and by an argument from the continuity between them and the higher sensations. As against this we pointed out (a) that there is just as good reason to use the argument from continuity in the opposite direction; and (b) that very possibly, in spite of the continuity, there is a real difference in nature between genuine sensations and bodily feelings. In favour of the view that genuine sensations are analysable into act and object, we pointed out that there seems to be a plain difference between a red patch sensed by me and the total fact described as "my sensation of a red patch." And we suggested that those who refuse to make this analysis are forced to the very paradoxical conclusion that there are states of mind which are literally red, round, hot, loud, etc.

The next point was this. Assuming that sensations are analysable into act of sensing and sensum, we raised the question whether sensa are states of mind, or, if not, whether they are existentially mind-dependent. We agreed that, if they are states of mind at all, they must be presentations. But we found no positive reason for thinking that they are states of mind, and much the same reasons against that view as led us to hold that sensations are analysable into act and sensum.

We then discussed three more or less plausible arguments to show that sensa are existentially mind-dependent, i.e., that they cannot exist except as objective constituents of sensations. We saw no intrinsic reason why coloured patches or noises should not be capable of existing unsensed. And we refused to be moved from this view by an argument from continuity with bodily feelings. For we were far from sure whether bodily feelings really are analysable into act of sensing and sensum; and we suggested that, even if they be, it is by no means certain that their sensa could not exist unsensed. We tried to show why this was thought to be obvious, and to show that it is not really so.

The two remaining arguments seemed to us to show that sensa are partly dependent on the position, etc.,
of the body, but they did not have any tendency to show that they are existentially dependent on the mind. Still, some of the facts adduced did rather strongly suggest that sensa and, a fortiori, images, are to some extent qualitatively mind-dependent. We thought that this reference to the mind might be removed by extending the bodily conditions, so as to include physiological traces and dispositions. But, in view of the wholly hypothetical character of these, we were not prepared at this stage to deny that sensa and images might be to some extent qualitatively mind-dependent. And there we leave the matter, till we deal more fully with the part played by the human body in sense-perception. We have seen that the whole question is highly complex, and that the arguments for the view that sensa are mental are by no means lacking in plausibility. We shall not therefore be tempted to think that everyone who has been persuaded by them must be either a knave or a fool. Some of those who call themselves New Realists have been too much inclined to take this attitude; and, on one reader at least, they have produced the impression of being rather offensively "at ease in Zion."

(ii) How are Sensa related to Physical Objects?—We can now turn to the second question which we raised about sensa. The plain man does not clearly distinguish between physical objects and sensa, and therefore feels no particular difficulty about their mutual relations. We first come to recognise sensa as distinct from physical objects by reflecting on the fact of sensible appearance, and the contrast between it and the supposed properties of physical reality. But once the existence of sensa has been clearly recognised, the problem of their relation to the physical world becomes pressing. We all believe in a world of physical objects, and profess to have a great deal of detailed knowledge about it. Now this world of physical objects makes

its existence and its detailed nature known to us by the sensible appearances which it presents to us. And, on the sensum theory, these appearances are sensa. Sensa are therefore in some way the ratio cognoscendi of the physical world, whilst the physical world is in some way the ratio essendi of sensa. Our problem therefore divides into an epistemological and an onto-logical one. The two problems are not ultimately independent, but it is useful to state them separately.

(1) How far is it true that our beliefs about the physical world depend on our sensa? Before we can answer this, we must draw some distinctions among our beliefs. First, there is our belief that there is a physical world of some kind. This, as we have seen, involves at least the belief that there are things which are relatively permanent, which combine many qualities, and which persist and interact at times when they are not appearing to our senses. These we may call constitutive properties of the physical world, since they are part of what we mean by "physical." Then there is the belief that these objects have spatial or quasi-spatial characteristics. This may almost be called constitutive, but it is a shade less fundamental than the first set of properties. Lastly, there are what might be called empirical beliefs about the physical world. These are beliefs about points of detail, e.g., that some things are red, and that there is now a red fluted lampshade in my rooms.

Now I have already asserted that it is false psychologically to say that we, in fact, reach our perceptual judgments about the existence and properties of physical objects by a process of inference from our sensa and their properties. Further, it is false logically to suppose that the existence of a physical world in general could be inferred from the existence of our sensa, or from anything that we know about their intrinsic properties or their mutual relations. I suppose that the existence of sensa is a necessary condition, but it is certainly not
a sufficient condition, of my belief in the existence of the physical world. If there were no sensible appearances to me, I suppose that I should not judge thereto be any physical reality. But, on the other hand, there is nothing in my sensa to force me logically to the conclusion that there must be something beyond them, having the constitutive properties of physical objects. The belief that our sensa are appearances of something more permanent and complex than themselves seems to be primitive, and to arise inevitably in us with the sensing of the sensa. It is not reached by inference, and could not logically be justified by inference. On the other hand, there is no possibility of either refuting it logically, or of getting rid of it, or—so far as I can see—of co-ordinating the facts without it.

There are groupings among my own sensa and correlations between my sensa and those of others which fit in extremely well with the belief in a physical world of which all the sensa are so many appearances. It might be held that this at least forms the basis of a logical argument in inverse probability, to show that the belief in the physical world is highly probable. But the snag here is that all such arguments only serve to multiply the antecedent probability of a proposition, and, unless we have reason to suppose that this probability starts with a finite magnitude, they lead us nowhere. Now, although I do not know of any reason antecedently against the existence of a physical world, I also know of no antecedent reason for it. So its antecedent probability seems quite indeterminate, unless we are prepared to hold that the fact that everybody does in practice believe it, is a ground for ascribing a finite antecedent probability to it. It seems to me that the belief that there is a physical world is logically in much the same position as those assumptions about the constitution of the existent on which all inductive proofs of special laws of nature rest. If these assumptions start with a finite antecedent probability, their success justifies us in ascribing a high final probability to them. But do they have a finite antecedent probability? We can say of them, as of the belief in a physical world, that we all do believe them in practice, that there is no positive reason against them, and that we cannot get on without assuming them. But, having said so much, we shall do wisely to change the subject and talk about the weather.

We shall not then attempt to prove the existence of a world of entities having the constitutive properties of physical objects; for, if this can be done, I at any rate do not know how to do it. But we shall point out those facts about our sensa and their groupings which specially fit in with the view that sensa are various partial and fleeting appearances of relatively permanent and independent things. That is, we shall try to indicate those facts about our sensa which would give a high final probability to the belief in a physical world, provided it had a finite antecedent probability. This will be our main task in the next two chapters, which deal with the spatial and temporal characteristics of sensa and of physical objects and events. The first of these chapters will be concerned with the facts about our sensa which fit in with the view that they are appearances of objects which combine many properties, and which can be perceived by many different observers at the same time. The second will be concerned with the facts about our sensa which fit in with the view that they are relatively fleeting appearances of more permanent things and processes.

Now, assuming that there is a world of enduring and independent things, there is still room for wide differences of opinion as to the kind of whole that it forms, the way in which it is divided into parts, and the various empirical qualities which these parts possess. Common-sense and science are agreed that it is in some sense a spatial whole, whose parts have various shapes, sizes and positions, and are capable of moving about...
within the whole. This alleged spatial character of the physical world may be called "semi-constitutive"; for, as I have said, we hardly admit that a world of non-spatial entities would deserve to be called "physical," even though it were persistent, independent of us, and many-qualified. Now, it is clear that all the spatial characteristics which we ascribe to the physical world are based, both in general outline and in detail, on the spatial characteristics of our sensa. Moreover, I think it can be rendered highly probable that, if there be a physical world at all, and our sensa be appearances of it, then that world is quasi-spatial. The importance and complexity of this subject seem to justify the length of the next chapter, in which I have treated it to the best of my ability.

When we come to the purely empirical qualities of the physical world there is a sharp difference of opinion between science and common-sense. The latter ascribes qualities, like colour, temperature, etc., to physical objects, whilst the former refuses to do so. In discussing this matter the partial dependence of sensa on what goes on inside the body of the observer becomes of great importance, and the concluding chapter has been devoted to this problem.

(2) This last question leads in the most natural way to the ontological problem as to the status of sensa in the existent world. There is a world of physical objects and a world of sensa. In some way the latter seems to be dependent on the former. But both are parts of the whole of existent reality. How are they related? This is a problem which common-sense ignores, because it does not definitely distinguish between sensa and physical objects. Science also ignores it, because, although in theory it makes an equivalent distinction, it uses it simply as an excuse for ignoring sensa and concentrating on physical objects and processes. This is a perfectly legitimate procedure for the special purpose which natural science has in view, but it is not permissible to the philosopher. His whole business is to drag such skeletons from the cupboards in which it has been found convenient to shelve them, and to give them their right place in the whole scheme of things.

Now the epistemological and the ontological problems about sensa and their relations to physical objects are connected in the following way. Our primitive belief in the existence of a world of relatively permanent, independent, things is extremely vague. It is little more than a general scheme, in terms of which the actual groupings which we find among our sensa are stated. Even when we go a step further, and say that the spatial character and the special groupings of sensa practically force us to think of the physical world as a quasi-spatial whole, containing parts with fairly definite shapes, sizes, and positions, we still have only a very general, though much more definite, scheme. Within this general quasi-spatial scheme all kinds of alternative specifications are possible. We are not tied down to any special view as to the number of its dimensions. Again, we are not tied down to any special view as to the "geometry" of it, when the number of its dimensions is settled. Lastly, we might put forward dozens of different theories as to the nature of physical objects, all compatible with the general scheme and with the special facts about our sensa and their groupings. It is this extreme variety of alternative theories, left open to us by the general concept of a physical world and the special facts about our sensa, which gives a legitimate hope for indefinite progress with the problem under discussion, provided the scientists and the patriots between them do not destroy civilisation, and with it all disinterested thinking. With traditional views about the nature of Space, Time, and Matter, it is extremely difficult to fit the world of sensa and the world of physical objects together into a coherent whole. But, once the immense number of possible alternatives within the scheme is grasped, the devising of theories of the physical object which shall
give sensa a *locus standi* in the physical world will be a
winter evening's pastime for symbolic logicians. This task
we shall leave to those better fitted than ourselves to
accomplish it; we shall be concerned rather with those facts
about our sensa with which any theory of physical objects
must deal.

**The Critical Scientific Theory.**—I propose now to try
to state clearly, in terms of the Sensum theory, what
appears to be involved in the common scientific view of
physical objects and their sensible appearances. As
scientists never state their own position on this point
clearly, it is necessary for us to do so for them. We can then
see how far the view can be accepted, and how far its
plausibility has depended on its modest obscurity.

Let us take the old example of a boy looking at a penny.
He believes that it is quite literally round and just as
literally brown. He believes that the brown (and, as he
thinks, round) patch which he is sensing is quite literally a
part (viz., the upper, side) of the penny. And he believes
that this, which he now sees, is the same as what he can
feel if he puts out his hand. As he grows up he is probably
told, on the authority of "science," that the penny is not
"really" brown, though it is "really" round. The sort of
reason which he is given for this startling statement is (so
far as I can remember) that things appear to have different
colours in different lights. If he should study heat and light,
his will be told that the colour which he sees depends on
vibrations which strike his eye, and that the temperature
that he feels depends on molecular movements which are
going on in the penny. He still thinks of the penny as
literally round, and thinks now of all sorts of movements
going on within its contour, and sending disturbances to his
eye and his hand. But he no longer thinks of the penny as
literally brown or cold. The brownness and coldness
are thought to be effects which the processes in the penny
produce by transmission. The round shape is "in" the penny;
the brownness and coldness are not. They are effects
which the penny produces "in" his eye or his hand or his
brain or his mind. He still thinks that he literally senses the
same round upper side of the penny, both with his eyes and
with his hand, but he no longer thinks that there is a brown
colour or a cold temperature literally spread over this round
surface.

This, I think, is a fair account of what the average person
with a scientific training believes on these matters; so far as
anything so incoherent can be said to be believed by
anyone. It is perfectly obvious that such a view as this
cannot stand criticism. It is an inconsistent mixture of two
utterly different theories of perception. As regards spatial
attributes, it keeps to the naively realistic view of
unsophisticated common-sense. According to it, the seen
and felt shape is not an effect produced in us by something
else. It is out there, whether we see it or feel it or not.
Processes in it simply make us see it or feel it under
suitable circumstances. But, as regards colour and
temperature, the scientific theory takes quite a different
view. It is a causal theory. The processes in the penny do
not make us see a colour or feel a temperature which is
already there to be seen or felt. They produce the colour or
temperature "in us," to use a discretely vague phrase, which
may cover our minds, our brains, and our special sense-organ.

Now this muddled mixture of theories is not consistent
with itself or with the facts. It is inconsistent with itself for
the following reason. When I look at a penny, the brown
colour that I see is seen spread out over the round contour.
Similarly with the cold temperature that I feel. We are
asked to believe that there is brownness without shape "in
me," and round shape without colour out there where the
penny is,
and yet that in some mysterious way, the shapeless brownness "in me" is projected into the round contour of the penny "out there." If this be not nonsense I do not know what nonsense is. We can all say this kind of thing, but can we attach any clear meaning to what we are saying?

Moreover, as Berkeley long ago pointed out, the theory only takes account of half the facts. Certainly colours vary with the illumination, the state of our eyes, and so on. But it only needs a little careful inspection to see that visible shapes also vary with changes in the medium, and with the position of the observer. If the former fact proves that colours and temperatures are not "in the object" but "in us," the latter should prove the same thing for visible shapes. It is impossible to reconcile the view that the penny is round, in the literal straightforward sense, with the view that, when we look at it, we literally sense visually the upper surface of it. For we sense all sorts of elliptical patches from various positions. It is clear that none of these can be identical with the round upper surface of the penny, and it is equally clear that they are not parts of it in the literal sense in which the King's head is a part of it.

If we want to be consistent then, we must treat visual shape in the same way as colour and temperature. What we sense visually is a sensum, and the shape and the brownness both belong to it. If anything be produced "in us" by an external object when we look at it, it is not just the colour, but is the whole patch with its colour and its shape. And, as we have seen, this patch cannot be regarded as being the upper surface of the external object, or as being literally a part of that surface. Nor can we any longer hold that what we sense by touch is literally identical with what we sense by sight, and that sight and touch merely reveal two different qualities of this one object. For what we sense factually is round and of constant size.

What we sense visually is not round, except when we are in that very special set of positions from which we are said to be "looking straight down on" the penny. And, even if we confine ourselves to this series of positions, the sizes of the various round patches which we sense are not the same for different positions in the series. It is therefore clear that the scientific view needs to be completely restated in terms of the sensum theory. And this is not easy, because the scientific theory assumed that we really were sensing the "contour of the actual physical object out in space, and that our sensations were due to what was going on within that contour.

As we move about and continue, as we say, to "look at the same object," we are aware of a series of sensa, each having shape and colour, and all very much alike in these respects. But there are certain variations which we commonly overlook. These strike us in exaggerated cases, and can be noticed by careful inspection in all cases. Moreover, they are as a rule reversed when we retrace our steps. If we are going to attempt a causal theory of perception we must try to explain this conjunction of predominant agreement throughout the series with slight, regular, and reversible variations between its different members. The explanation that naturally strikes us is that the series of sensa depends on two sets of conditions. One of these is relatively permanent, and accounts for the predominant agreement of the members of the series. The other is variable, and accounts for their minor variations.

Again, if we feel an object, such as a penny, and meanwhile look at it from various points of view, the series of predominantly similar, but slightly variant, visual sensa is correlated with an invariant tactual sensum. The shape of the latter is very much, but not exactly, like those of most of the former. It is exactly like that of the visual sensa which are sensed from a certain series of positions. As regards other qualities, there
is complete difference between the visual and the tactual sensa. The former have colour, but no temperature or hardness; the latter have coldness and hardness, but no colour. Now we have to explain this predominant agreement, combined with minor differences, between the shape of the many visual sensa and the shape of the one tactual sensum. And we have to remember that, as regards other sensible qualities, the difference is complete. Here, again, it seems natural to suppose that there is something common and relatively permanent, which accounts for the predominant agreement in shape between the visual and the tactual sensa, and something variable that accounts for their minor differences in shape. This other factor seems clearly to be connected with the position of the sense-organ. As the eye moves about, the shape of the visual sensa varies. The shape of the tactual sensum does not change: but then we cannot move the hand to a distance and continue to sense the tactual sensum at all, as we can change the place of the eye and still continue to see. We may further suppose that different factors are needed to determine such very different sensible qualities as colour and temperature; but it is reasonable to suppose that, whatever these factors may be, they are subject to some common condition which determines the very similar shape of both visual and tactual sensa.

Lastly, when we compare notes with other people who say that they are looking at the same thing as we are, we find again a predominant agreement between their sensa and ours, combined with minor variations. It seems reasonable to suppose that there is a set of conditions, common to their sensa and ours, which accounts for the predominant agreement between the two. In addition, there must be variable factors, one specially connected with one observer and another with another observer. These are responsible for the minor variations. It seems, then, that we have good grounds for supposing that there are physical objects in the sense of conditions which (a) are common to us and to others; (b) are relatively permanent, and, at any rate, do not ipso facto change when we move about; and (c) determine in some way the attributes of our sensa, in conjunction with other conditions which do vary from person to person at the same time and for the same person at different times.

It might be asked at this point by a sceptical reader, "Why go outside the series of correlated sensa at all? Why not be content to take them as a fact? Why make them all depend on conditions outside the series of sensa itself?" As I have said, this is a step which everyone does take, but which no one can be logically compelled to take. At present we may say that what induces us to do this is the fact that we have reason to think that physical objects change and act on each other when we do not happen to be sensing any sensa from them. We can drop such series of sensa as I have been describing (e.g., by turning our heads or going out of the room), and then by making suitable movements we can pick it up again either where we left it, or in a form that is obviously a later development of a course of change whose earlier stages we noticed before we turned away. It is facts of this kind which (rightly or wrongly) make us look beyond such series of correlated sensa to relatively permanent conditions, which lie outside the series and can develop on their own account when the series is interrupted.

Now these common and relatively permanent conditions might, for all that we have seen up to the present, be so utterly unlike the sensa that they condition that it would be misleading to call them physical objects. The question therefore at once arises: "Can we determine anything further about their properties, either with certainty or with reasonably high probability?" I do not think that we could determine anything further with certainty, but I do think that we might determine something further with
high probability. It is, of course, perfectly true that a set of conditions—and, moreover, a set which is only one part of the total conditions—of a sensum, must not be assumed to resemble in its properties the sensum which it partially determines. On the other hand, it were equally unreasonable to assume that the two cannot resemble each other. There can be no inner contradiction in the qualities of shape and size, since sensa, at least, certainly have shape and size and certainly exist. If such qualities involved any kind of internal contradiction, no existent whatever could possess them. Hence it is perfectly legitimate to postulate hypothetically any amount of resemblance that we choose between sensa and the permanent part of their total conditions. If now we find that, by postulating certain qualities in these permanent conditions, we can account for the most striking facts about our sensa, and that without making this hypothesis we cannot do so, the hypothesis in question may reach a very high degree of probability.

Now we find that the visual sensa of a group which we ascribe to a single physical object are related projectively to each other and to the tactual sensum which we ascribe to the same object. If we regard their common permanent condition as having something analogous to shape, we can explain the shapes of the various sensa in the group as projections of the shape of their common permanent condition. If we refuse to attribute anything like shape to the permanent conditions, we cannot explain the variations in shape of the visual sensa as the observer moves into different positions. This does not, of course, prove that the common and relatively permanent conditions of a group of sensa do have shape, but it does render the hypothesis highly plausible. We have already seen that it is a legitimate one, that there is no reason why these common conditions should not have shape; we now see that it is also a plausible one, since with it we can, and without it we cannot, account for the variations in the shapes of the sensa of the group.

What about the so-called "secondary qualities," like colour and temperature? We know that Descartes, Locke, and the orthodox natural scientists, hold that we have no right to ascribe them literally to physical objects, whilst Berkeley and many other philosophers have argued that primaries and secondaries must stand or fall (and that they, in fact, fall) together. What is the truth about this matter? The first need is to state the doctrine of primary and secondary qualities in a clear and intelligible form. Unquestionably, colour and temperature belong to our sensa, at any rate, in the same literal way in which shape and size belong to them. What I am immediately aware of when I look at a penny stamp is as indubitably red as it is indubitably square. Similarly, when I hold a round piece of ice in my hand, what I am aware of is as certainly cold as it is certainly round. Thus, to say that colours and temperatures are "unreal," or "do not really exist," is patently false, if this means that there is nothing in the Universe of which it is true to say: "This is literally red," or "This is literally cold." Such statements are true of many sensa, at any rate, and sensa are parts of the existing Universe.

The only substantial question is: "Do colours and temperatures ever literally belong to physical objects, or do they belong literally only to sensa?" What the scientist is trying in an extremely muddled way to do is to assert the physical reality of shapes and sizes, and to deny the physical reality of colours, temperatures, noises, etc. Now this view, when clearly stated, comes to the following: "Shapes and sizes belong to physical objects in the same literal way in which they belong to sensa, and from the shapes and sizes of sensa we can generally infer with reasonable certainty those of that physical object of which these sensa are appearances. Colours, temperatures, etc., belong literally to sensa,
but they belong to physical objects only in a derivative and Pickwickian sense. There must, of course, be something in the permanent conditions of a group of sensa which wholly or partly determines the colour or temperature of the latter. But this something is not colour or temperature." We have seen what sort of ground there is for the positive part of this view: is there any good reason to believe the negative part of it?

It is sometimes thought that the physical theories of light and heat positively disprove the common-sense view that physical objects are literally coloured or hot. This is a sheer logical blunder. The physical theory of light, e.g., asserts that, whenever we sense a red sensum, vibrations of a certain period are striking our retina. This does not prove that bodies which emit vibrations of that period are not literally red, for it might well be that only bodies which are literally red can emit just these vibrations. The vibrations might simply be the means of stimulating us to sense the red colour, which is literally in the body, whether we happen to sense it or not. (I am quite certain that this simple-minded theory cannot be made to fit the extremely complicated facts; but it is compatible with the fact that we only become aware of colours when vibrations of a certain kind affect our eyes; and therefore this fact does not, as is often supposed, refute the common-sense view that bodies are literally coloured and that we actually sense the colours which are on their surfaces.)

I think that the negative part of the scientific view does express an important fact, but that it needs to be stated in a much more guarded way. (i) It is certain that, if physical objects possess shape and size at all, they must have some other quality, related to shape and size in the same general kind of way in which colour and temperature are related to the shape and size of sensa. You cannot have extension et præterea nihil; you must have something that can be spread out and cover an area or fill a volume. (2) There is no reason why these "extensible" qualities, which must be present in physical objects, if they be extended at all, should not actually be colour and temperature. Since sensa certainly exist, and are certainly coloured, there can be no internal contradiction in the notion of an existent colour. (3) On the other hand, of course, the extensible qualities of physical objects need not be colour or temperature. So long as they are qualities that can cover areas and fill volumes, as colour and temperature do, they might differ from any quality that is ever present in our sensa. (4) Whilst we found that the assumption that the permanent conditions of groups of sensa have shape, and that they and our bodies have position, does help us to predict the shapes of various sensa in the group, we do not find that the ascription of colours or temperatures to these permanent conditions helps us to predict the colours or temperatures of the sensa in the group. It is found more profitable to correlate the colours and temperatures of sensa with the hypothetical movements of hypothetical parts of their permanent conditions. This does not prove, as has often been thought, that physical objects cannot literally have colours or temperatures. Of course, if the sensa that we sense cannot literally be parts of the surfaces of physical objects, it follows that the colours and temperatures of these sensa can not literally be identical with the colours and temperatures of physical objects, even if the latter have such qualities. The facts under discussion do show that the hypothesis that physical objects literally have colours and temperatures, though legitimate enough, is not capable of empirical verification, and therefore cannot be asserted with any high probability.

The view which I have been trying to state may be called the Critical Scientific Theory. It is simply an attempt to formulate clearly, in terms of the Sensum Theory of sensible appearance, the view about the ex-
ternal world which has been at the back of the scientific mind since the time of Descartes and Locke. In its original form this view was a mass of inconsistencies, since it was naively realistic for our perception of shape, size, and position, and held a causal theory for our perception of colour, temperature, etc. This combination of theories proved to be inconsistent with the inextricable entanglement of the two kinds of qualities, which we actually find. Moreover, the naively realistic part of it proved untenable in face of the variations of visual shape and size, which are obvious when we view what is regarded as a single unchanged physical object from various positions.

Thus the only hope for the scientific view was to restate it in a completely causal form. A serious difficulty at once arose. The causal part of the old view presupposed the naively realistic part. When we were told that motions within a circular contour at a certain place in space caused sensations of colour and temperature "in us," we understood this, because we thought that we literally saw and felt this contour in this place. But, as soon as the theory is made completely causal, both spatial and non-spatial attributes belong primarily to the effect produced "in us" by something else. It then becomes difficult to see that we have any better right to regard this cause as literally endowed with shape, size, and position, than as literally endowed with colour and temperature. Yet the scientific theories about the causation of our sensations of colour, temperature, etc., are stated in terms which seem to lose all meaning unless the causes of these sensations literally have shapes, sizes, and positions. The Critical Scientific Theory, as stated by us, has been an attempt to meet these difficulties, to reformulate the distinction between primary and secondary qualities, and to estimate the amount of value which this distinction can justly claim.

I think that the Critical Scientific Theory is internally consistent, so far as it goes; but I certainly do not believe that it is ultimately satisfactory. In the first place, it continues to use a number of phrases whose meanings are no longer obvious when we have given up the notion that we literally sense parts of the surfaces of physical objects. It still talks of pennies being "round," of a number of different people at "the same time" and the same person at "different times" all perceiving "the same penny" from "different places." We must reinterpret all these phrases in terms of our sensa and their relations before we can hope to get a consistent theory. I shall try my hand at this very difficult job in the next three chapters.

Secondly, our theory uses the phrase that processes 'in external physical objects and our bodies "jointly produce in us" the sensa by which we become aware of them. The phrase in inverted commas covers a multitude of problems. Do physical processes create sensa out of nothing? Or do they just cause us to sense now one and now another selection out of a mass of already existing sensa? And, on either alternative, what is the status of sensa once they have come into existence? Do they just exist alongside of physical objects? Do they ever interact with each other or produce effects on the physical world? Or are they, in some Pickwickian sense, parts of physical objects? With some of these problems I shall try to deal in my last chapter.

The following additional works may be consulted with advantage:
B. A. W. Russell, Lectures on the External World, Lects. III. and IV; Analysis of Mind, Lects. V. and VII.
J. Laird, Problems of the Self, Cap. III.
G. E. Moore, Philosophical Studies.
Berkeley, Principles of Human Knowledge.
Descartes, Meditations.